



AGRICULTURAL RESEARCH INSTITUTE
PUSA

"No Flaw in its Claim to be
ABSOLUTELY PURE."

—MEDICAL ANNUAL.

Fry's

PURE BREAKFAST

Cocoa

— A LIQUID FOOD —
WITH SOLID VALUE.

ALSO

Fry's

Malted Cocoa

316154



IARI

Supplies to Invalids and all those possessed of weak digestive powers, a delicious, refreshing, and invigorating beverage.

"Excellent. Its dietetic and digestive value is beyond dispute."—*Lancet*.

Members of the Profession are cordially invited to write for Samples to—

J. S. FRY & SONS, LTD., BRISTOL.

300 GRANDS PRIX, GOLD MEDALS, &c.

The word "Glaxo" in a stylized, cursive font with a horizontal line underneath.

STANDARDISED DRIED MILK
is obtainable in Three Forms

The word "Glaxo" in a stylized, cursive font with a horizontal line underneath.

(FULL-CREAM)

This is the standardised full-cream dried milk, containing over 25% butter fat, which has already achieved a world-wide reputation as a safe and suitable milk for infants, invalids, and general use. Contains NO cane sugar. Packed in blue-lettered tins.

The word "Glaxo" in a stylized, cursive font with "No. 1" written below it, all within a decorative frame.

(HALF-CREAM SWEETENED)

This is a standardised half-cream dried milk, containing not more than 14% butter fat, and with approximately 10% of cane sugar added; the remainder of the carbohydrates being lactose (milk-sugar). Only suitable for infants under three months, and special cases as directed by a doctor. Packed in chocolate-printed tins.

The word "Glaxo" in a stylized, cursive font with "No. 2" written below it, all within a decorative frame.

(THREE-QUARTER-CREAM SWEETENED)

This is a standardised three-quarter-cream dried milk, containing not more than 20% butter fat, and with approximately 10% of cane sugar added; the remainder of the carbohydrates being lactose (milk-sugar). Packed in green-printed tins.

*Samples and Literature sent free to
Members of the Medical Profession.*

GLAXO (Medical Dept.), 155, GREAT PORTLAND ST.,
LONDON, W.1.

Proprietors: Joseph Nathan & Co. Ltd., London and New Zealand.

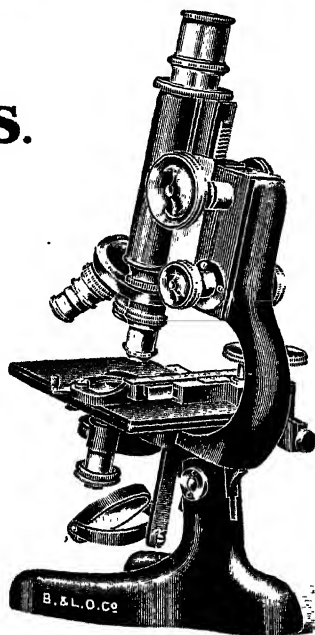
3 JUN. 1921

Bausch Lomb MICROSCOPES

**FOR ALL
REQUIREMENTS.**

Also
MICROTOMES,
PHOTOMICRO-
GRAPHIC
APPARATUS,
CENTRIFUGES,
Etc.

*Full particulars
on application.*



Bausch & Lomb Optical Co. Ltd.

*Contractors to British, Indian, Colonial and Foreign
Governments.*



**37-38 HATTON GARDEN,
LONDON, E.C.1.**

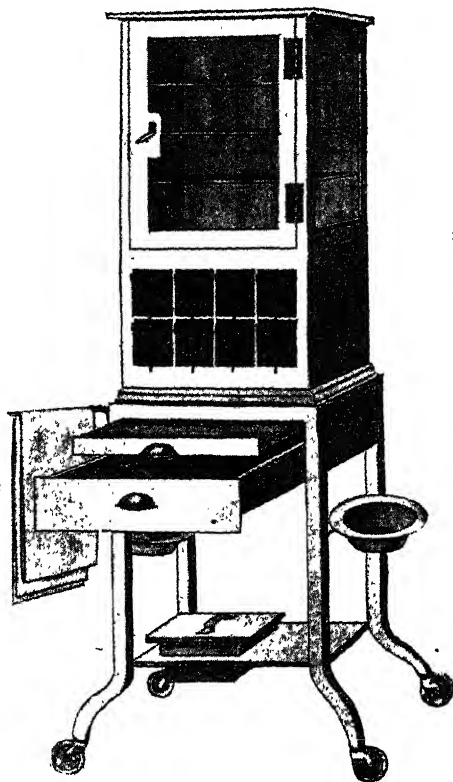
Our instruments may be obtained through all Dealers.

Combined Aseptic Cabinet & Stand

FOR MINOR OPERATIONS.

Size :

70 in. high,
18 in. wide,
11 in. deep.



Price,
without
Dressings,
£14 10 0
net.

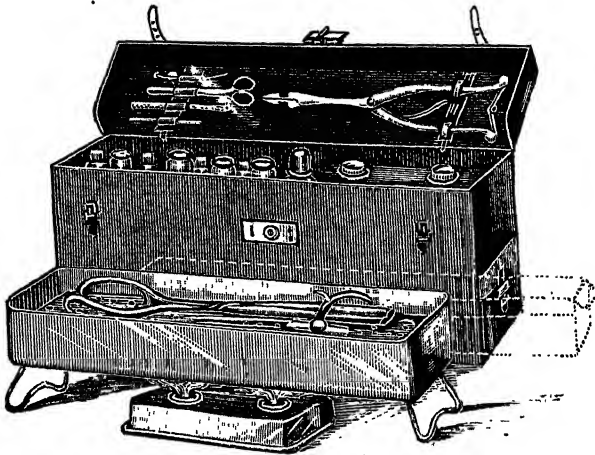
THE upper portion is a well made white enamelled Cabinet, with glass front and sides, three glass shelves, plated lock and hinges. Below are eight compartments to hold Dressings, these contain strong cardboard dust-proof boxes, to which tapes are attached to facilitate their removal from the pigeon holes.

The lower portion of the Stand has a glass instrument tray, and an enamelled metal drawer below. There are two enamelled solution bowls, and a box for soiled dressings; also an electro-plated towel rail. The whole Cabinet is on rubber-tyred castors.

R. SUMNER & CO. Ltd., LIVERPOOL:

Modern
and
Improved

MIDWIFERY BAG WITH STERILIZER.



The bag is made of cowhide (either black or brown) and has a compartment beneath into which the Sterilizer fits.

The Sterilizer has no seams, being blocked out in one piece from a solid metal sheet and heavily nickel plated.

The larger instruments are carried in Sterilizer, the top portion of the bag being reserved for Nail Brush, Lamp, Chloroform Bottle, Pill and Medicine Bottles, Dredger, leaving room for Apron, Gloves, &c.

The inside Cover has loops arranged for carrying the smaller instruments.

PRICE of the Bag, together with Sterilizer, Lamp, Nail Brush, Minim Measure in case, Chloroform Drop Bottle in case, Dredger, 3 Pill Bottles, 3 Medicine Bottles.

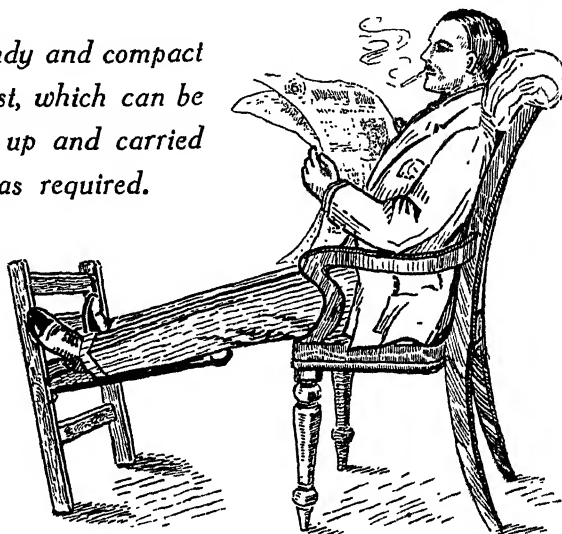
£8 8s. (or £9 10s. if of solid leather throughout).

An outside Canvas Cover can be supplied at 15/- extra.

R. SUMNER & CO., Ltd.,
SURGICAL INSTRUMENT MAKERS, LIVERPOOL.

FOLDING LEG REST.

A handy and compact Leg rest, which can be folded up and carried about as required.



It can be used, with any kind of chair, whether high or low, giving perfect ease and rest, and enabling invalids and convalescents to sit for hours without fatigue.

It is a boon in every household, as it is such a comfort in moments of leisure.

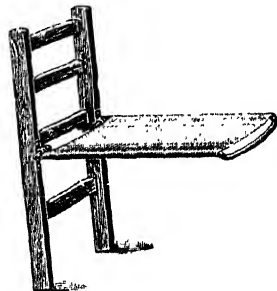
It is particularly recommended for Hospitals and Convalescent Homes.



When closed it can be packed in a trunk for travelling, thus ensuring a comfortable and easy chair at all times.

When open, it is a supported canvas trestle on which the legs rest with comfort, without producing stiffness or stagnation.

To sufferers from Gout, Rheumatism, Varicose veins, etc., it is invaluable.



Price 12/6 each.

R. SUMNER & CO. Ltd. - LIVERPOOL.

Vaccineurine

Indications:

FACIAL NEURALGIA

In old-standing cases which have defied all kinds of treatment it has been found very successful.

SCIATICA

Most favourable results have been obtained in acute and chronic cases.

NEURITIS

Whether arising from exposure, alcoholic excess, rheumatism, diphtheria, &c.—a certain marked and rapid benefit has followed.

TABES

Favourably influenced.

A mixture of several bacteriolytic Vaccines which destroy neurotropic micro-organisms and which have proved after extended trials of great value in the treatment of

NEURALGIA, NEURITIS, SCIATICA, TABES.

Injections are made in the extensor muscles of the arm, if possible in the spaces between the tissues or intramuscularly in the gluteal region.

The full treatment consists of three series, in all 18 injections. These doses are graduated up to the maximum (or 18th) dose.

The first series (6 doses) may be regarded as the "Immunity" dose.

The second and third (12 doses) as the "Curative."

Prepared by

**THE SWISS SERUM AND VACCINE
INSTITUTE,**

BERNE, SWITZERLAND

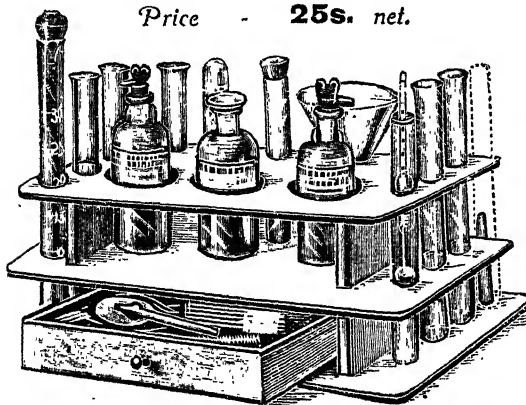
R. SUMNER & CO., Ltd., Wholesale Druggists, 40, Hanover St., Liverpool.

Sole Agents for the Swiss Serum and Vaccine Institute for Great Britain and the Colonies, from whom a descriptive pamphlet of their products may be obtained by Medical Men on application.

Sumner's URINARY TEST STAND

Supplied with URINARY TESTING APPARATUS and SOLUTIONS.

Price - 25s. net.



The Stand is of Polished Mahogany, substantial and well made, and is quite suitable for the Consulting Room Table. The contents are as follows :

Urinometer, Albuminometer, Spirit Lamp, Drop Pipette with graduated C.C. Tube, Test Tubes, Funnel, 2-oz. Stoppered Bottle of Nitric Acid, 2-oz. Drop Bottle of Roberts' Test Solution for Sugar, 2-oz. Drop Bottle containing Esbach's Test Solution for Albumin, Test Tube Brush, Packet each Red and Blue Litmus Paper, Packets of Filter Paper, Watch Glass, Graduated Pipettes.

National Insurance New Medical Cabinet

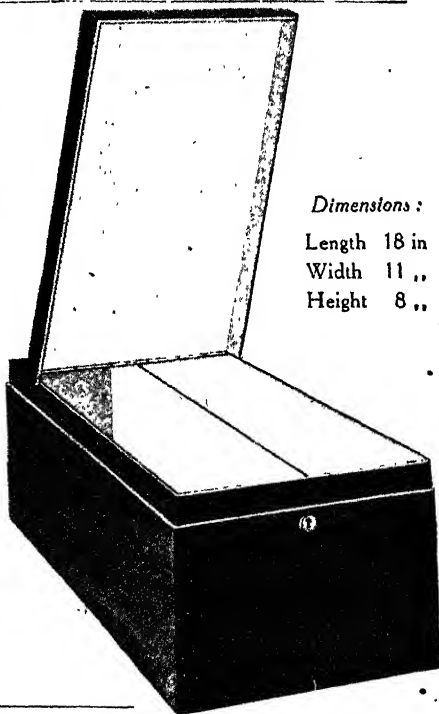
This Cabinet is japanned black outside and white inside, and is of the very best workmanship and finish. It is provided with a lock and key.

Each Compartment is made to hold 500 Record Cards, and allowance is made for proportionate expansion for the Continuation Cards which will in time come to be used. The Cabinet is therefore suitable for a panel of 1000; for higher numbers a second one is required, as boxes to hold more cards are cumbersome, and, when full, very heavy to handle.

If Men's and Women's Cards are kept together, one set of Alphabetical Guide Cards per box is sufficient; if separately, one set is required for each compartment.

Price - 32s. 6d. each net.
Carriage paid.

GUIDE CARDS - 3s. per set.



Dimensions :

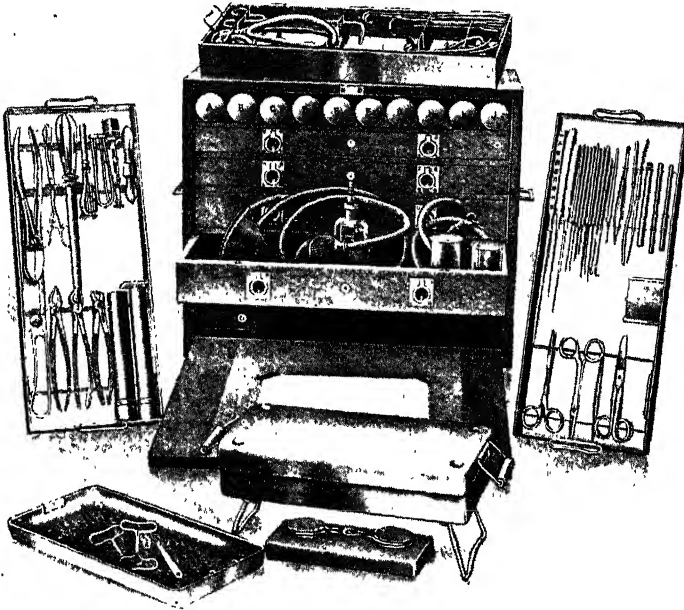
Length 18 in
Width 11 „
Height 8 „

R. SUMNER & CO. Ltd., LIVERPOOL.

MAJOR OPERATION CASE

FOR

EXPEDITIONS, SHIPS, etc.



THIS Case has been devised by Mr. ARTHUR EVANS, F.R.C.S., of Liverpool, and is carried by many of the principal ships sailing out of the port of Liverpool. It constitutes a most efficient and complete Surgical Equipment suitable for use on Ships, for Colonial practitioners, or for Expeditions. The case itself is made of seasoned oak which will not warp, and therefore all drawers will continue to open freely, even in hot and moist climates. The Instruments can be varied to suit requirements. Everything in the case is of the best English manufacture.

Price - £55 net.

R: SUMNER & CO. Ltd. - LIVERPOOL.

ELIXIR CALCII CREOSOTI.

A concentrated, aromatic, slightly
alkaline preparation, containing

Five per cent Beechwood Creosote
in *chemical* combination with Lime.

ALTHOUGH the therapeutic value of Creosote is generally recognized, its acid taste and the fact that it retards digestion have militated against its wide employment.

Various means are adopted to try and overcome this objectionable characteristic—it has been emulsified, has been made into pills, enclosed in gelatine capsules and combined with various chemicals—but even under these conditions the drug is liable to cause nausea, unpleasant eructations, or some other form of digestive disturbance.

When Creosote is treated by Lime under certain conditions, a mixture of the Calcium derivatives of the constituents of Creosote is produced. This mixture is chiefly composed of Calcium Guaiacolate and Calcium Creosote, which are chemically analogous to Phenate of Soda.

It is soluble in water, has a pleasant warm taste, and possesses all the therapeutic properties of Creosote.

INDICATIONS.

Elixir Calcii Creosoti is strongly recommended whenever Creosote is indicated, particularly in **Phthisis**, **Pneumonia**, and **Bronchitis**. It is also a powerful antiseptic, and therefore prescribed in **Enteric Fever**, &c. In small doses, after meals, the Elixir is found most useful for **Flatulent Dyspepsia**.

DOSAGE.

Usual dose for an Adult is half to two drachms diluted with water.

For Children over six, up to half a drachm

For Infants, three to five minims

As the Elixir is well tolerated by the stomach, it forms a means of pushing the dose of Creosote much further than when other preparations of the drug are used.

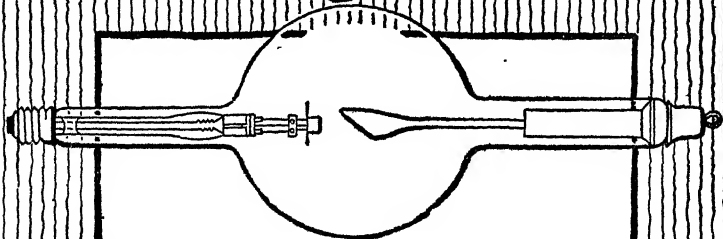
NOTE.—One drachm is equivalent to three minims of Creosote.

(As Elixir Calcii Creosoti should be taken freely diluted, the best way to dispense is to make up an ounce of the Elixir to eight ounces with water; thus two tablespoonfuls of this mixture is equivalent to three minims of Creosote.)

Prices :	Per 1-lb. Bottle	...	4/-
	„ ½-lb. „	...	2/3

R. SUMNER & CO. Ltd.,
Wholesale Druggists, LIVERPOOL.

The Economy of *Coolidge Tubes*



The Surgical Radiographer of a large London Hospital

reports :

"Fifteen thousand cases have been done by Coolidge Tubes since 1916.

One Tube did over 6,000 cases before it had to be abandoned.

One of the four Tubes is still in use.

Six thousand cases would appear to be a fair estimate for one Tube.

Formerly we averaged 150 cases to a Gundelach Tube, which Tube would cost from £4 to £6.

Roughly speaking, Patients cost us, as far as Tubes were concerned, two-fifths of a shilling per head. Now, with Coolidge Tubes, they cost $\frac{1}{7}$ of a shilling."

On Sale by all the Principal Dealers,

The BRITISH THOMSON-HOUSTON Co. Ltd.

(Owners of the British patents),

77, Upper Thames Street,
London, E.C. 4.

Branches in
all large towns. T.116.

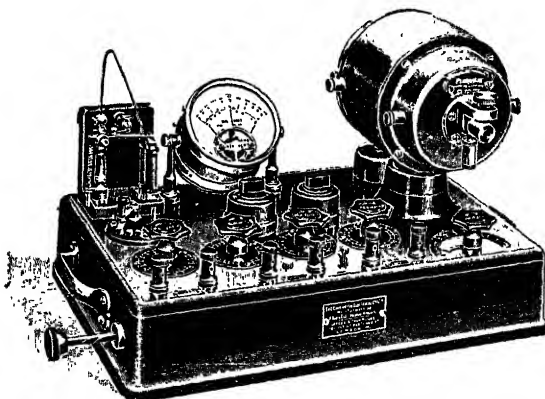
Once you have used the Coolidge
X-Ray Tube you will never go
back to ordinary tubes.

COX-CAVENDISH

TWYFORD ABBEY WORKS,

ACTUAL MANUFACTURERS

ELECTRO-MEDICAL &



“PLUROSTAT” (Regd. Trade Mark) **“EARTHFREE”**
UNIVERSAL APPARATUS

SPECIAL OFFER.—THE BOOK OF THE PLUROSTAT
 (23 pp.) fully illustrating and describing the manifold uses of this
 remarkable Apparatus — **POST FREE ON REQUEST.**

Makers of the highest grade X-Ray and Electro-
 Medical Apparatus of all types. Illustrated
 Catalogue, 1920 Edition, on request.

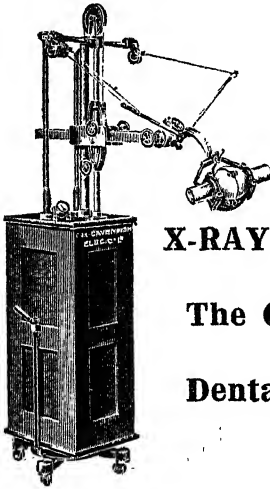
WEST-END SHOW ROOMS:
SCOTTISH BRANCH:

ELECTRICAL C^O. L^D.

HARLESDEN, LONDON, N.W. 10.

OF EVERY DESCRIPTION OF

X-RAY APPARATUS



X-RAY TRANSFORMER SET

FOR

The General Practitioner,

AND

Dental or Bed-side Use.

PLEASE WRITE FOR PARTICULARS.

The Cox-Cavendish Electrical Co. Ltd. has the largest capital, staff, and factory in the British Empire devoted to this class of apparatus.

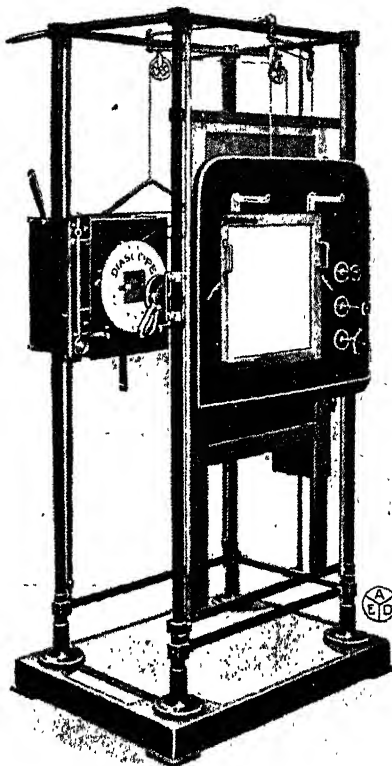
105 GREAT PORTLAND STREET, W. 1.
15 HANOVER ST., PRINCES ST., EDINBURGH.

THE DIASCOPE

The Standard Apparatus
of the World for the
X-RAY EXAMINATION
of the

THORAX

HEART



STOMACH

INTESTINES

Full particulars from the
SOLE MAKERS:

A. E. DEAN & CO.,

*Manufacturers of X-Ray and Electro-Medical
Apparatus of the highest quality.*

LEIGH PLACE, BROOKE ST., HOLBORN, LONDON, E.C.1

The New Electric Laryngoscope.

THIS new electric Laryngoscope dispenses entirely with the renewal of batteries, and is always ready for use, whenever you want it, without any preparation whatever.

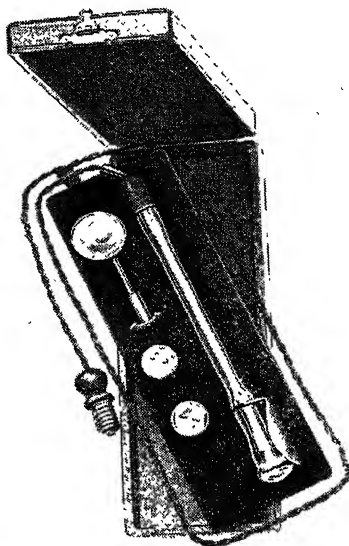
The hand lamp generates its own electricity, and when Laryngoscope is required, simply press in contact plug in hole provided at side of hand lamp. This throws the hand lamp out of action automatically.

The accessories supplied with Laryngoscope include angled concave mirror, tongue depression plate, three special magnifying bulbs, ebonite contact plug.

All bright parts are beautifully silver-plated. Supplied complete in neat case.

**No Batteries. No Refills.
Always Ready.**

Made to last a life-time.



Automatic Electric Lamp



The "Electro Automate" which generates its own electricity by means of lever, when not used in conjunction with laryngoscope may be used as an ordinary hand lamp. It gives a beautiful white beam, will work under water or in any climate, and is guaranteed.

The entire outfit may be carried in your pocket quite easily.

For excellency of workmanship in construction, and efficiency in working, the "Electro Automate" cannot be compared to any similar lamp.

PRICES :

Ordinary Hand Lamp without Laryngoscope

45/-

post free.

Ordinary Hand Lamp with Laryngoscope Accessories in case

63/-

post free.

Send your Order NOW to—

THEO & COY., 6, Hatton Garden, LIVERPOOL.

Telephone: 658/9 Central.

Telegrams: "Armature."

ESTABLISHED 76 YEARS.

ELLIOTT, SON & BOYTON,

(Sir J. Boyton, P. H. Winter, H. H. Holt, and H. E. Allpress.)

Auctioneers, Estate Agents, and Surveyors,

6 VERE STREET, CAVENDISH SQUARE, W.1.

WEST END HOUSES. WEST END VALUATIONS. .

WEST END CONSULTING-ROOMS.

Messrs. Elliott, Son & Boyton are the best local Agents for Houses and Consulting-Rooms in the Harley, Wimpole, Welbeck, Queen Anne, and other streets off Cavendish and Portman Squares. Their old-established connection affords them special knowledge and much exclusive information concerning properties in the neighbourhood.

Tel.: MAYFAIR 2408, 2409.

A Rational Method of Using Tuberculin in the Treatment of Pulmonary Tuberculosis.

By JOHN R. GILLESPIE, M.A., M.D., D.P.H.,

Tuberclosis Medical Officer, County Down.

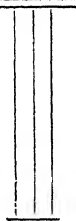
"Dr. Gillespie has certainly made a thoughtful and logical contribution to tuberculin therapy."—THE LANCET.

May be had from the Printers,

GRAHAM & HESLIP, Franklin St., BELFAST.

Price 2s. 6d. net; post-free 2s. 9d.

Your Son's Career.



- § Exceptional opportunities for Young Men (15-25) in the WIRELESS and CABLE SERVICES.
- § Students are accepted in this College for Board-Residence and rapidly trained amongst pleasant and healthy surroundings.

Write for free prospectus—

THE NORTH WALES WIRELESS SCHOOLS,
The Wireless College, (Dept. M. A.), CARNARVON.



MICROSCOPES

and Accessories for all Scientific Researches.

FOR ALL LEADING MAKES OF

SURGICAL INSTRUMENTS,

CYSTOSCOPES, URETHROSCOPES
(PROFS. VALENTINE and WOSSILO),
KOLLMAN'S DILATORS,
HOSPITAL FURNITURE,

APPLY TO

O. C. RUDOLPH & BEESLEY,

65 Margaret St., Oxford Circus, London, W.1

X-RAY & ELECTRO-MEDICAL APPARATUS.
 Estimates given for COMPLETE INSTALLATIONS.
 COOLIDGE and all LEADING MAKES of X-RAY TUBES
 in Stock.
 APPARATUS INSPECTED AND KEPT IN ORDER.

MOTTERSHEAD & CO. 7, EXCHANGE STREET, MANCHESTER.
 (A. E. H. BLACKBURN.)
 Telegrams: "OTTER," MANCHESTER. Telephones: 4320, 4321 City (Two Lines).

By Sir ARBUTHNOT LANE, Bart., M.S.
 SECOND EDITION. With 226 Illustrations. 10s.

OPERATIVE TREATMENT OF FRACTURES.

THIRD EDITION. With 58 Illustrations. 10s.

CLEFT-PALATE & HARE LIP

WITH ADDITIONAL CHAPTERS BY
 Mr. CORTLANDT MACMAHON and Mr. WARWICK JAMES.

ADLARD & SON & WEST NEWMAN Ltd., 23 Bartholomew Close, E.C.1

Demy 8vo. With 510 Illustrations. 8/6 net. Postage 6d.

LIGATIONS AND AMPUTATIONS
FOR STUDENTS AND PRACTITIONERS.
 By A. BROCA, *Professor of Operative Surgery at the Faculty of Medicine of Paris.*
 Authorized translation by ERNEST WARD, M.A.(Camb.), M.D., F.R.C.S.
 "Illustrations are models of simplicity and clearness."—*Med. Press and Circ.*

BRISTOL: JOHN WRIGHT & SONS Ltd. London: Simpkin & Co. Ltd.

MEDICAL MEN should consult

SIMMONS
D. H. SIMMONS

The PRIVATE CAR Specialist.

Agent for MOTOR UNION INSURANCE.

*May I advise you on Purchase, Sale,
or Maintenance of your Car ? Expert
knowledge and unbiassed opinion. Why
not consult ME ? I have made a point
of studying your exact Requirements.*

SPECIALITIES :

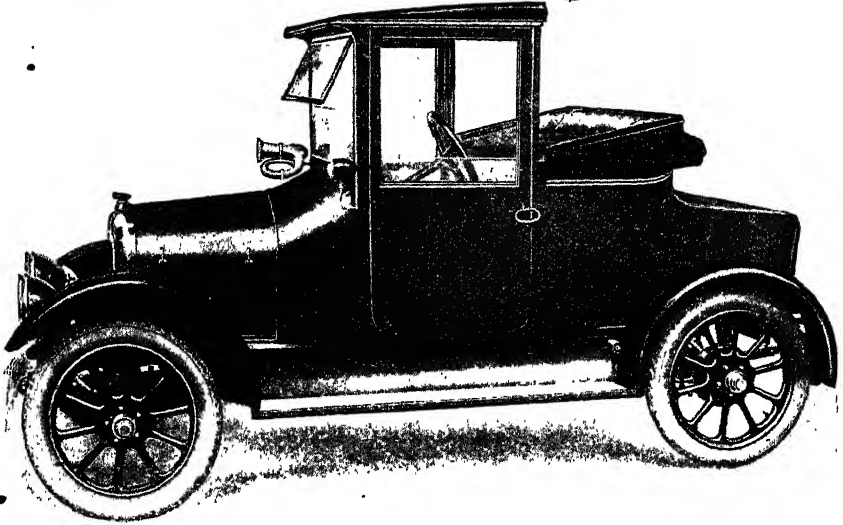
*DUNLOP' and PALMER TYRES.
Jeavon's Self-lubricating SPRING GAITERS.
LIGHTING & STARTING SETS, all makes.
EVERY ACCESSORY.*

**433-434 Ulster Chambers, 168 Regent St.
LONDON, W.1.**

Telegrams : "Nukars, Reg. London."

Telephone : Regent 5880.

The SINGER "10"



An Ideal Car for a Doctor

THE NEAT AND HANDSOME DESIGN OF THE SINGER "10" WILL ALWAYS IMPRESS THE OBSERVER AT A GLANCE. BUILT THROUGHOUT BY HIGHLY SKILLED WORKMEN FROM THE FINEST MATERIALS PROCURABLE, WE HAVE NO HESITATION IN RECOMMENDING IT TO STAND THE HARD WEAR AND TEAR TO WHICH A MEDICAL PRACTITIONER'S CAR IS SUBJECT. IN THE MATTER OF DELIVERY, PRECEDENCE IS GIVEN TO DOCTORS.

Catalogue and full particulars can be obtained from—

SINGER & CO. Ltd. COVENTRY,

and 17 HOLBORN VIADUCT, LONDON, E.C.

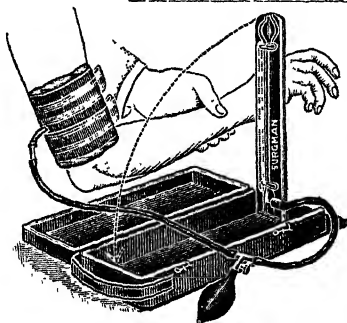
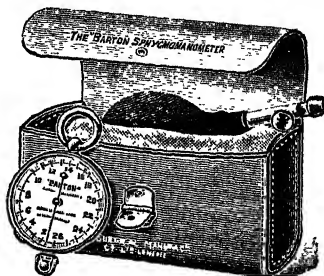
ENG.

The "BARTON" Sphygmomanometer

Accurate and Portable.
British Made and Guaranteed.

We shall be pleased to send on approval to any Member of the Profession on application.

Price - £4 4s.



The "SURGMAN" Sphygmomanometer

The advantages claimed for this instrument are:

Its simplicity.

The mercury cannot be spilled.

The systolic pressure can be read accurately and immediately.

Its compactness, size of case outside being only $12 \times 4\frac{1}{2} \times 3$.

Price, complete in leather-covered case with leather handle, £2 7s. 6d.

THE OBSTETRIC HELPER

In introducing THE OBSTETRIC HELPER at the Royal Society of Medicine, Dr. Laphorn Smith pointed out the following advantages which it possessed:—

1. It was always available to take the place of two helpers.
2. It could be absolutely relied upon to hold the two knees firmly near the chin even if the patient were an athlete. Two persons sometimes failed to do this.
3. It avoided any breaks in the aseptic chain, because the patient's feet could not possibly touch the doctor's sterilised gloved hands or the forceps.
4. It weighs only 5 ounces and occupies a space of $4 \times 2\frac{1}{2} \times 2$ inches.
5. It can be applied either before or after anaesthesia equally well, whether the patient is in the dorsal or left lateral position. As there are only two hooks to be snapped on the rings it only requires a few seconds to apply it.
6. Having three sets of rings it can be applied equally well to a big or little woman.

Price - 12s. 6d.

We shall be pleased to send on approval.



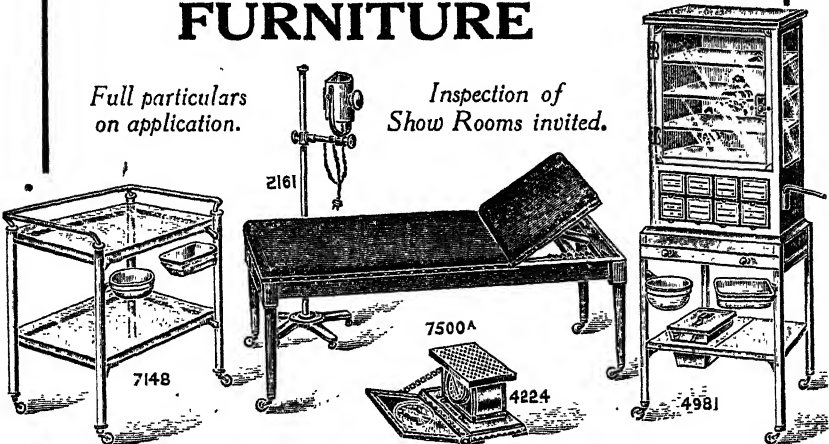
THE SURGICAL MANUFACTURING CO., LTD.

Surgical Instrument Makers to the War Office, etc.,
83-85 Mortimer Street, LONDON, W.1.
Also at 89 West Regent Street, GLASGOW.

CONSULTING ROOM FURNITURE

Full particulars
on application.

Inspection of
Show Rooms invited.



7148	Instrument Table, White Enamelled Steel, with two Plate Glass Shelves, etc., as illustrated. Size 25 x 16	£6 18 6
7500A	Consulting Room Couch	£7 15 6
2161	Macdonald's Lamp on Nickel-plated Standard	£5 15 0
4224	Personal Weighing Machine	£2 17 0
4981	The "Congress" Cabinet & Dressing Table Combined	£15 0 0

The BARD-PARKER KNIFE.

NOTED FOR ITS SHARPNESS.

This knife is designed to eliminate the nuisance and uncertainty of resharpening, by means of renewable blades which have the sharpest cutting edge attainable. A used blade can be instantly replaced by a new one with a keen edge at less than the cost of resharpening an ordinary scalpel. The surgeon is thus assured of a knife of standard sharpness always ready for use.



1/2 Size. Blades Nos. 20, 21 and 22 Fit Handle No. 4. (Order by Size Number.)



Blades Nos. 10 and 11 Fit Handle No. 3. (Order by Size Number.)

Handles, all sizes, 5/- each. Blades, all sizes, (6 of one size in package,) 7/6 per dozen.
Cases, for 2 handles and 6 to 30 blades, 5/6 each.



**THE SURGICAL MANUFACTURING CO.,
LTD.**

Surgical Instrument Makers to the War Office, etc.,

83-85 Mortimer Street, LONDON, W.1.
Also at 89 West Regent Street, GLASGOW.

DOMEN

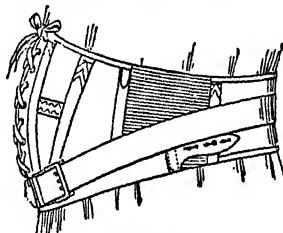
Belts and Belt-Corsets

RECOMMENDED by the LEADING PHYSICIANS & SURGEONS.

Fit well, sit comfortably, and do not get out of place. They give great comfort and relief in all Abdominal Complaints, and after Operations.



BELT-CORSET.



SYSTEM II.

Extract from *Medical Annual*, 1917:

"It is in Enteroptosis that we have used it most frequently, and with invariably good results." This refers to the Belt illustrated above.



DOMEN
BACK SUPPORT.



The DOMEN BANDAGING

Ideal for every purpose where a Bandage is required.

Elastic (without rubber), porous, combines great strength with light weight.

WRITE FOR ILLUSTRATED PRICE LIST.

DOMEN BELTS CO. Ltd.

456 STRAND, LONDON, W.C. 2

LEDGER CARDS FOR MEDICAL BOOK-KEEPING

A Year's
Record
at a
Glance.

CODE		VISIT		CONSULTATION		C		MEDICINE		P		VISIT		REMARKS	
		MEDICAL		AND NURSING		CONFIDENTIAL		CONFIDENTIAL		CONFIDENTIAL		CONFIDENTIAL		CONFIDENTIAL	
TO BALANCE BROUGHT FORWARD															
JAN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
FEB	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
MAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
APR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
MAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
JUNE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
JULY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
AUG	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
SEPT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
OCT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
NOV	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
DEC	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
DOCTOR'S REMARKS															
BALANCE FORWARD															

PRICES :

5/- per 100

24/- „ 500

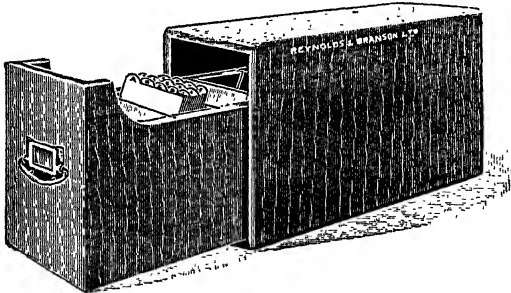
47/- „ 1000

These Cards have the advantage of combining Day Book, Ledger, and recording prescriptions or treatment on one card.

A card is allotted to each patient, and by adoption of the simple code illustrated, a complete record of a year's account can be kept on one card.

The months can commence from any quarter day, so that if a doctor makes up his books on, say June 30, he would order cards commencing with July as first month; or, if preferred, they may be had plain, i.e., without months or code.

They are stocked in three colours—white, green, and salmon.



CABINETS for above.

In mahogany or oak, one, two, or four drawers, complete with index cards.

SUPPOS. BISMUTH SUBGALLAT. Co. (R.&B.)

in the Treatment of Hæmorrhoids.

Bismuth Subgallate is a non-irritant antiseptic, and as a suppository in conjunction with Resorcin and Zinc Oxide, tinted to a uniform colour with a harmless vegetable extract, is an excellent remedy for the relief of hæmorrhoids, &c.

PRICE 1/6 per doz., 15/- per gross.

Samples free on application.



REYNOLDS & BRANSON LTD.

Telegrams :
"REYNOLDS, LEEDS,"

LEEDS.

Telephone :
LEEDS 20047.

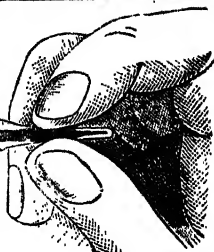
THE "REPELLO" TM

CLINICAL THERMOMETER.

No Shaking Required.

A 30 sec. reset instantly.
N.P.L. Tested.

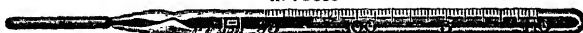
Made in all kinds.
Guaranteed Accurate.



NEW IMPROVED LENS FINDER

The only Easy Reading Magnifying Clinical
Thermometer on the Market.

IN FOCUS



OUT OF FOCUS



The square mark engraved on lens front locates the Index immediately.

Special Award and Gold Medal, New Zealand, 1907.

Silver Medal, India, 1909. Silver Medal, London, 1913.

Of all Instrument
Makers, Chemists, &c.

All Thermometers supplied tested at the National Physical Laboratory.

Inventor and Patentee: Contractor to H.M. Government.

G. H. ZEAL, 82, Turnmill St., LONDON, E.C.1

Wholesale Manufacturer of all kinds of Clinical Thermometers.

Telephone: Museum 3030. Telegraphic Address: "Brawoodine Eusroad."

A. E. BRAID & CO. L^{TD}.

Close to Euston Sq. Station (Met. Rly.) Opposite University College,

30 GOWER PLACE, GOWER STREET, LONDON, W.C.1

Contractors to the Admiralty, War Office, India Office, and Belgian Government.

SOLE AGENTS for THE

"STERLING" Rubber GLOVES



(Manu-
factured
in
Canada)



REGD TRADE MARK

Made of the highest grade Rubber, of uniform thickness and perfect shape. Fully guaranteed. The results of numerous tests show their superiority after many sterilizations.

FIRM GRIP, MEDIUM WEIGHT, 3/9 per pair

SMOOTH, MEDIUM WEIGHT 3/6 per pair

Special Terms for Quantities on application.

Clinical Thermometers, 2/3 each.

Hypodermic Syringes, all metal, with 2 needles, in N.P. case, each 5/6 and 10/6.

Hypodermic Syringes, all glass, with 2 needles, in N.P. case, 20 m/m 3/9, 2 c/c 4/9, 5 c/c 11/6, 10 c/c 14/6, 20 c/c 17/-.

Hypodermic Syringes, "Record," complete in case with 2 needles, 20 m/m or 1 c/c 8/6, 2 c/c 11/6, 5 c/c 15/-, 10 c/c 18/-, 20 c/c 25/- each.

Dressing Scissors, 2/3 and 3/- each.

Binaural Stethoscopes, 10/6 and 15/- ea.

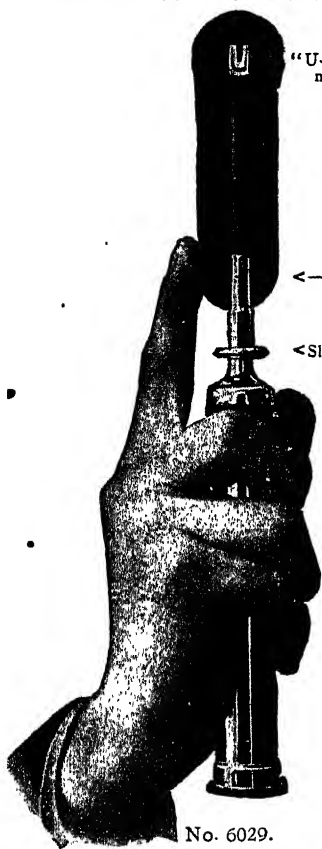
GEORGE SPILLER Ltd.

Surgeons' Opticians,

Ophthalmic Instrument Designers & Makers.

ESTABLISHED 1875.

Awarded Gold Medal at the XVIIth International Congress of Medicine.



"U-shaped mirror."

<—Driving wheel 6005.

<Sliding lamp control 6029.

<Rheostat and switch

No. 6029.

ELECTRIC OPHTHALMOSCOPES

1917 MODELS

(As supplied to the War Office).

6005. Morton Marple Flex and Battery Pattern, focussing vulcanite handle and switch case battery.

6029. Morton Marple "Perfection" Model Battery in Handle Ophthalmoscope (Reg. No. 627,804). The Standard Instrument. Simplicity of control—Driving wheel, focussing slide and rheostat manipulated with one hand. Fitted with special locking key to prevent wastage of battery. Life of cells three months average intermittent use.

"TRAQUAIR" ADAPTER,

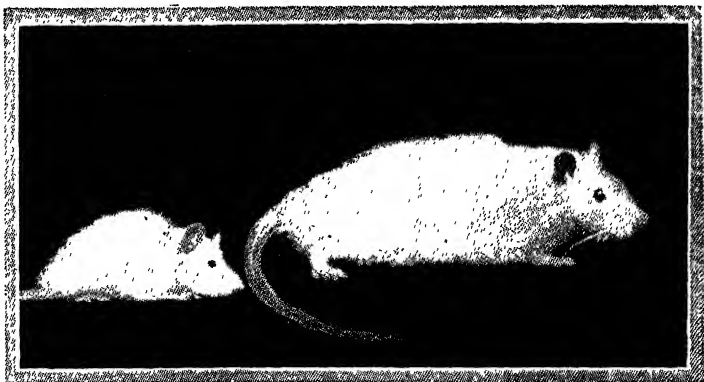
An ingenious device enabling different Batteries and varying Voltages to be used in cases of emergency.

6030. Practitioner Model Battery in handle, Swanzy Marple pattern. Handle same construction as No. 6209.

Price List on application.

·32 WIGMORE STREET, LONDON, W.1

TELEPHONES: 636 and 648 Mayfair.
GRAMS: Spilleropt, London.



VITAMINES ARE ESSENTIAL FOR NUTRITION.

Reproduction of photograph of two rats, brothers, started on their respective rations at the same time, the one being given an ample supply of the growth-promoting vitamin whereas the other was allowed only a sub-minimal amount; all other essential dietary factors were given to each. The difference in size after nine months of the treatment is very marked. It is now recognized that certain articles of diet, e.g., margarine, white bread, etc., are deficient in vitamin content, and that foods which naturally contain vitamins are often seriously impaired by processes of storage, sterilization, cooking, etc., to the detriment of the physical, and also the mental, vigour of those who subsist on them.

METAGEN

is a combination of

CONCENTRATED VITAMINE EXTRACTS

—the water-soluble and the fat-soluble
types—for therapeutic administration.

METAGEN is indicated specifically in such vitamin-deficiency diseases as marasmus, scurvy, and polyneuritis, and as a supplemental therapeutic agent in rickets and pellagra. It is used with beneficial results as an adjuvant in the treatment of conditions characterized by or due to faulty metabolism, as malnutrition, under-development, secondary anæmia, and in convalescence from acute infectious disease. The dose is from 5 to 30 grains daily.

Metagen is supplied in 5-grain capsules (bottles of 50).

PARKE, DAVIS & COMPANY,

50 Beak Street, Regent Street, LONDON, W.1.

FOR ALL FORMS OF
NERVOUS EXHAUSTION, ANÆMIA,
NEURASTHENIA, DEPRESSION, IMPOTENCY,
INSOMNIA resulting from DEBILITY

PRESCRIBE

• **“ALEXINE”** ASSIMILABLE
PHOSPHORUS

NOW OBTAINABLE IN GREAT BRITAIN.

“ALEXINE” supplies to the system active Phosphoric Acid—the most potent of nerve cell foods. “ALEXINE” is being regularly prescribed with great success by hundreds of prominent medical men in France. “ALEXINE” is prepared only in the Laboratoire de l’Alexine to the formula of Dr. JOULIE. It is now obtainable in this country, of Chemists, at 5s. and 10s. 6d. per bottle (post free 5s. 6d. and 10s. 9d.), or direct from the

SOLE BRITISH AGENTS:

HEPPELL’S, FOREIGN CHEMISTS, 164 Piccadilly, W.1

Alopecia areata - Pomade Max
Alopecia areata - Pomade Max

Alopecia prematura - Pomade Max
Alopecia prematura - Pomade Max

Loss of Hair, no matter from what cause arising, should be perseveringly treated with POMADE MAX. Apparently hopeless cases receive marked benefit generally almost immediately.

• **POMADE MAX** (Ung. Cantharidin
c. Hydrarg Co.)

For Alopecia Prematura & Alopecia Areata.

A dermatologist writes:

“Without stretching language in the least we may say that it really appears to be a
SPECIFIC FOR BALDNESS.”

An L.R.C.P., Harrogate, writes Sept. 15, 1915:

“Send pot Pomade Max for own use.”
“A Patient (syphilitic) has used it with wonderful results.”

MAY, ROBERTS & CO. Ltd. 9 and 11, Clerkenwell Road,
LONDON, E.C.

Fcap. Svo, with Frontispiece. Cloth, 2/6 net. Postage 4d.

LECTURES ON SURGICAL NURSING.

By E. STANMORE BISHOP, F.R.C.S. Eng., *Late Hon. Surgeon, Ancoats Hospital, and Gynecol. Surgeon, Jewish Memorial Hospital, Manchester.*

• “This small book is altogether excellent.”—*Lancet*.
“This little volume hits off almost exactly the proper line to take in telling nurses about the true inwardness of the system they are taught to observe.”—*Brit. Med. Jour.*

BRISTOL: JOHN WRIGHT & SONS Ltd. London: Simpkin & Co. Ltd.

**OOO
V****"THREE-OH-VEE"**

OOO V FINE OLD OOO V
GAUTIER FRÈRES'
LIQUEUR BRANDY.

(GUARANTEED 20 YEARS OLD.)

Extract from THE LANCET, 14th August, 1897.—"The product before us, being a genuine grape spirit and possessing those estimable characters in regard to aroma and flavour of real Cognac Brandy, is peculiarly well adapted for medicinal purposes."

Extract from THE HOSPITAL, 14th August, 1897.—"It is a brandy highly suitable for general use or for medicinal purposes when a liqueur brandy is desirable."

*Apply to BROWN, GORE & Co. (Wholesale Agents only)
40 Trinity Square, E.C.3. for name of nearest Dealer.*

GAUTIER FRÈRES, Cognac, Established 1755.

**OF ALL WINE MERCHANTS
AND STORES.**

GOLD MEDAL - LONDON, 1910

THE FRENCH NATURAL MINERAL WATER

VICHY-CÉLESTINS

The attention of Members of the Medical Profession is drawn to the fact that VICHY-CÉLESTINS and the other State Springs of the Vichy Waters, are being regularly imported, and ample supplies are always on hand.



These Waters are continually being prescribed by the leading Physicians, and are largely used in the Hospitals.

NATURAL VICHY SALTS, for Drinking and Baths.
VICHY DIGESTIVE PASTILLES, prepared with
Natural Vichy Salts.

CAUTION—Each bottle from the STATE SPRINGS
bears a neck label with the word "**VICHY-
ÉTAT**" and the name of the **SOLE AGENTS**—

INGRAM & ROYLE, Ltd.,

Bangor Wharf, 45 Belvedere Rd., London, S.E.1

And at **LIVERPOOL** and **BRISTOL**.

Samples Free to Members of the Medical Profession.

By
Appointmentto
H.M The King

NESTLÉ'S MILK

is the purest Cow's Milk preserved only with the best sugar.

It contains all the "vitamines" or "accessory food factors" of fresh milk, as is proved by the fact that children reared upon it thrive admirably.

Scientific analysis has shown that Nestlé's Milk is free from the bacilli of tuberculosis and other harmful organisms.

Unlike dairy milk, Nestlé's Milk has never been known to convey the infection of typhoid fever, scarlet fever, diphtheria, etc.

"Nestlé's Baby Book, 1920,"

containing Parents' Reports on 617 Children,

— will be sent free on application to —

Nestlé's Publishing Dept., 15 Arthur St., LONDON, E.C.4

By Appointment

to His Majesty



King George V.

BRAND'S

SPECIALTIES FOR INVALIDS

Manufactured from the Finest BRITISH MEATS.

ESSENCE OF BEEF

—AND OF—

CHICKEN AND MUTTON.

Valuable in cases of exhaustion, depression, and weak digestion due to influenza or any other cause, being easily assimilated by the weakest stomach, imparting at once fresh life and vigour to the whole system.

Invalid Jellies and Broths.

Mutton, Chicken and Beef Tea Jellies.

These preparations may be taken either as Jellies, or made into appetising nutritious drinks by putting a wineglassful into a breakfast cup and filling up with boiling water.

Brand's Meat Juice.

A Purely English Preparation, retaining the Albumen in its original uncoagulated form. Invaluable to Mothers and Infants.

Brand's Ferrocarnis.

A pleasantly flavoured solution of Iron in organic combination with Raw Meat Juice—Well tolerated and does not cause gastric disturbance.

Samples and full descriptive Lists sent free on application to—

BRAND & CO. LTD.,

Mayfair Works, Vauxhall, LONDON, S.W.8.

SAL HEPATICA.

AN Effervescent Saline Combination containing alterative and laxative properties similar to the natural "Bitter Waters" of Europe, with the addition of Sodium Phosphate.

SAL HEPATICA

possesses marked Anti-Rheumatic, Diuretic, and Cathartic properties.



BRISTOL-MYERS CO., MANUFACTURING CHEMISTS,
BROOKLYN. NEW YORK.

On sale by jobbers, and THOS. CHRISTY & CO., 4, 10, and 12
Old Swan Lane, Upper Thames Street, LONDON, E.C.

Sphagnol

OINTMENT & SOAPS

are made from a DISTILLATE OF PEAT, and have been awarded the CERTIFICATE of the INSTITUTE OF HYGIENE. Reports received from Medical Men testify to the wonderful efficacy of SPHAGNOL in the treatment of ECZEMA, HÆMORRHOIDS, PRURITUS, PSORIASIS, and other forms of Skin Irritation.

We shall be pleased to send complete sample set "H" of Sphagnol SOAPS & OINTMENT to every Doctor, on application to

PEAT PRODUCTS (SPHAGNOL), Ltd.,
19 Queenhithe, Upper Thames Street, LONDON, E.C.4.

For PIE CRUST, CAKES, PUDDINGS,

The leading professional Cooks now use

“ATORA”

Prepared solely from Fresh
BEEF SUET.

Contains no preservative.

**Sold in Blocks and
READY SHREDDED.**

1-lb. equals 2-lbs. Raw Suet.



Cooked in milk slightly sweetened, is an excellent substitute for Cod Liver Oil in consumptive cases, where the latter is refused, or very much disliked by the invalids. Suet Puddings and Baked Rice Puddings, with a little finely shredded Suet—say one table-spoonful in a pint of milk—are very nourishing for delicate children.

Sold by Grocers and Dealers in 1-lb. and ½-lb. Boxes.

HUGON & Co., Ltd., Cpenshaw, MANCHESTER.

THE FINEST WHISKY FOR MEDICINAL
AND GENERAL USE.

TRY THE **“HERO”** Brand
FAMED. **Old Scotch Whisky.**

“HERO” Liqueur, 30 u.p. **12/6**

“HERO” Liqueur, 35 u.p. **12/-**

*We pay carriage
on One dozen
and upwards.*

Rates of Postage :

ONE BOTTLE ...	1/-
TWO BOTTES ...	1/3

*We pack securely
and guarantee
safe delivery.*

CAN ONLY BE OBTAINED FROM—

A. DEWAR RATTRAY, Spirit Dealer,

188 Dumbarton Road, PARTICK, GLASGOW.

' ROCHE ' PRODUCTS

' OMNOPON '

Brand
Total Opium Alkaloids.

The total alkaloids of Opium in the form of soluble hydrochlorides. May be given by the mouth or by injection. Produces the well known sedative, soporific and analgesic effects of morphia, but is less constipating and less depressing to the respiratory centre.

' SEDOBROL '

Brand
Sedative Bouillon.

A novel preparation in the form of bouillon tablets containing 17 grs. (1.1 gm.) of Sodium Bromide in combination with fat and spicy vegetable extractives. One or two tablets dissolved in a cup of hot water provide an appetising broth, in which the presence of the bromide cannot be detected.

' SPASMALGIN '

Brand
Antispasmodic.

A compound of Papaverine and 'Atrinal' to which a small amount of 'Omnopon' has been added. An excellent therapeutic agent in all pathological conditions due to spastic stimulation of plain muscle organs:—Asthma, Dysmenorrhœa, etc. Acts not only symptomatically by relieving pain, but causally by removing the origin of the disorder.

' DIGALEN '

Brand
Amorphous Digitoxin
(Clœtta).

A sterile, standardised solution of Amorphous Digitoxin (Clœtta). May be given by the mouth or by injection. Yields prompt, powerful, and uniform digitalis effects, with freedom from gastric disturbances or toxic cumulation in normal doses.

Other well known ' ROCHE ' Products are—

' IODOSTARIN ', ' THIGENOL ', ' THIOCOL ', &c., &c.,
and the ' TUBUNIC ' AMPOULE-SYRINGE.

Specimens and descriptive matter on application to

THE HOFFMANN-LA ROCHE CHEMICAL WORKS Ltd.,

7 & 8, IDOL LANE, LONDON, E.C.3

Trade 'ROCHE' Mark

'TUBUNIC'

BRAND

AMPOULE-SYRINGE

Aseptic Hypodermic Medication
at a moment's notice with no
:: preliminary preparation ::

For full particulars write to—

The Hoffmann-La Roche Chemical Works Ltd.,

**7 & 8, IDOL LANE,
LONDON, E.C. 3**

Collosol Iodine-

containing Iodine in its most active condition. In all forms it is stainless, non-irritant, and avoids the disadvantages of Potassium Iodide and of Tincture of Iodine. It is prepared as:—1. Aqueous; 2. Pasta; 3. Oil; 4. Ointment. Indications: Rheumatism, Tuberculosis, Syphilis, Asthma, Eczema and other Skin affections, and Chilblains.

Dose: 1 to 3 teaspoonfuls in water after meals, three times daily.

Collosol Ferromalt

A combination of Pure Malt Extract with Colloidal Iron, rich in protein, diastase and vitamins—the essentials for perfect carbohydrate metabolism. In this colloidal suspension Iron does not cause constipation or digestive troubles.

COLLOSOL FERROMALT with HYPOPHOSPHITES. COLLOSOL FERROMALT with

GLYCEROPHOSPHATES.

Dose: 1 to 4 teaspoonfuls, according to age, in water after meals.

Collosol Argentum

A non-toxic and non-irritant colloidal silver germicide and antiseptic, for general use, by topical application, injection and internal administration. Indications: Septic and infective Wounds, Influenza, Tonsillitis, Haemorrhoids, Cystitis, Gollitis, Gonorrhoea, Diarrhoea, Bacillary Dysentery, and affections of the Throat, Nose, Ear, and Eye.

Dose: 1 to 2 teaspoonfuls in water, twice daily, fasting

THE ORIGINAL COLLOIDAL PREPARATIONS FOR MEDICINAL USE

CROOKES'

COLLOSOLS

COLLOSOLS are pure and stable colloidal solutions, isotonic and isomorphous with the elements of the body.

COLLOSOLS are tested by the ultra-microscopic, bacteriological, and clinical experiment.

Collosol Manganese

A colloidal suspension of Manganese for intramuscular injection of proved value in septic conditions of the blood. Indications: Furunculosis, Acne, Seborrhoeic Eczema, Quinsy, and Gonorrhoea: (Vide *British Medical Journal*, April 20th, July 20th, August 17th, and October 5th, 1918.)

Collosol Selenium

A colloidal suspension of Selenium, for intramuscular injection. For use in cases of Inoperable Carcinoma, etc. (Vide *British Journal of Surgery*, July 1920, p. 50.)

Collosol Ferrum

Collosol Iron is of established efficacy in Anaemia and Chlorosis. Given orally, colloidal iron is rapidly diffused in the stomach, and a large proportion of it is readily absorbed by the amino-acids formed in the process of digestion, and so haemoglobin is synthesised.

Dose: 1 teaspoonful well diluted with water after meals.

Collosol Cuprum

A colloidal suspension of Copper, for intramuscular injection. For use in cases of Inoperable Carcinoma, etc.

Collosol Sulphur

A colloidal sulphur suspension for internal administration and for use as baths, as Cream or as Oil. In this form taken internally the sulphur is entirely absorbed and avoids intestinal irritation.

Dose: 1 to 3 teaspoonfuls with water, during or after meals.

Collosol Zinc Cream

Non greasy and non-irritant. Cream Collosol Zinc being in the colloidal state, the zinc, on account of the infinite subdivision of the particles has considerable penetrative power, particularly if the cream be applied and then gently rubbed in.

Full Explanatory Brochure of all Collosol Preparations will be supplied Free on application.

The **CROOKES LABORATORIES**, BRITISH COLLOIDS, Ltd.
22 CHENIES ST., TOTTENHAM COURT ROAD, W.C.1.

COLLTON'S

Telephones—Museum 3663 and 3697

When Prescribing
Ol. Santal. Flav.

if the Drug is administered in
SAVARESSE'S MEMBRANOUS
CAPSULES the patient will be
caused

No NAUSEA,
No "REPEATING,"
No ERUCTIONS.

Each tin contains 22 x 10-minim Capsules.

The Sandal Wood Oil in
SAVARESSE'S CAPSULES

is distilled by ourselves, and is
absolutely pure.

SAMPLE ON APPLICATION.

EVANS SONS LESCHER & WEBB Ltd.

60 Bartholomew Close,
LONDON, E.C.1

56 Hanover Street,
LIVERPOOL.

And at NEW YORK.

THE ORIGINAL AND ONLY GENUINE.

RIGOLLOT'S MUSTARD LEAVES

Adopted by the Paris Hospitals, the French Army and Navy, and the British Army and Navy.

Cleanly, Efficient, Energetic, Portable, Sure.

Sold Retail by all Chemists & Druggists. Wholesale: 67 Southwark Bridge Rd., S.E. 1
7d. and 1/- packets; 1/7 tins.

BEWARE OF DANGEROUS IMITATIONS.

A GREAT ADVANCE IN SOAP CHEMISTRY

As a result of twenty years of strenuous work in chemical research and its practical application, "Sapon" Soap—a British Invention, developed with British Capital—has been perfected. It is the greatest advance in the chemistry of Soap since that article was first manufactured.

Ordinary Soap consists of Fat deglycerined and saponified with Caustic Soda.

"SAPON" SOAP

is derived from Carbohydrates, which, when treated by the Company's patented process, yield Ammonia, Methylamine, and Trimethylamine. These Nitrogenous compounds are highly emulsifying agents, and do NOT combine with Lime or Magnesia Salts in water, as all fat-derived soaps do. Hence, no "scum" or insoluble lime soap is formed, even in the hardest water when "Sapon" Soap is used.

A Harley Street Doctor writes:—

"I have found your 'Sapon' Soap most effective in clearing a muddy greasy skin. In one particular case in which I advised its use, the result was very striking—a healthy pink complexion replacing a dull muddy one."

SKIN DISEASES.

The Amines and Amido bodies in Sapon Soap are readily soluble in water. They are germicidal but non-injurious, owing to their colloid nature. Besides their efficiency as cleansers, they have a wonderful sedative action. This action is intensified by the addition of 10% of saponified Birch Root Tar in

"SAPON" RUSSIAN TAR SOAP.

A member of the Medical Profession writes:—

"I find your Russian Tar Soap gives wonderful results in irritable skin diseases, such as Scabies, Eczema, Pruritus, Insect Bites, Acne, etc."

A medical officer of a large Public Institution writes:—

"I find your Soap of the greatest use in keeping off fleas from my own body, which is a happy hunting field for their onslaughts."

The following is the best method of application: Moisten the Soap, rub it on the part affected and allow it to dry on the skin.

Free samples will be sent to any member of the Medical Profession on receipt of a postcard to:—

SAPON SOAPS, LIMITED, Sapon House, London Bridge, E.C.4.

TAMAR INDIEN GRILLON.

Price 4/6
per box.

A Laxative, Refreshing and Medicated

FRUIT LOZENGE

Price 4/6
per box.


FOR THE TREATMENT OF

**Constipation, Headache, Indigestion, Bile,
Hæmorrhoids, &c., &c.**

Invaluable to Young Mothers as it does not upset the Baby.

Warranted to contain neither Mineral nor Drastic.

Sold Retail by all Chemists & Druggists. Wholesale: 67 Southwark Bridge Rd., S.E. 1



Fellows' Syrupus Hypophosphitum

A concentrated mineral pabulum, possessing unrivalled therapeutic properties in all Wasting Diseases, which have been termed "Demineralizations" by modern clinicians.

Supplies the organism with those indispensable mineral elements:
Manganese Potassium Sodium Calcium Iron
 together with the dynamic action of quinine and strychnine.

"THE STANDARD TONIC."


Samples and Literature upon request.

FELLOWS MEDICAL MANUFACTURING CO., Inc.
 26 Christopher Street
 New York

‘ OPPENHEIMER ’ PRODUCTS

"OSCOL" Standardized COLLOIDS.
 Arsenium, Argentum, Cuprum, Ferrum, Hydrargyrum, Iodum,
 Magnesium, Manganesium, Selenium, Sulphur, etc., etc.

"ROBOLEINE."
 The Tonic and
 reconstructive
 Food, richest
 in VITAMINES.



"MOLSYNTH."
 A most satisfac-
 tory substitute
 for "Malt and
 Cod Liver Oil."

"STOKES" Patent Nasal INHALER.
 Made entirely of light rubber.
 Can be worn continuously, even during sleep.

"BI-PALATINOIDS" (No. 500) of Nascent Ferrous Carbonate.
 The Standard Haematinic.

"MAGLACTIS"
 corrects acidity without the evolution of gas.

For Full Particulars write to
OPPENHEIMER, SON & CO., LIMITED,
 179, Queen Victoria Street, LONDON, E.C.4
 Entirely British House since Foundation in 1891.

NURSING HOME in the MENDIPS

THE COURT, BLAGDON, near Bristol.



BLAGDON COURT is a comfortable Country House, standing in beautiful grounds of 4½ acres. The house is situated on the edge of the charming village of Blagdon, in the pure and healthy air of the Mendips. The house is five minutes' walk from Blagdon Church and Post Office, and within easy distance of the station, from which Bristol is reached via Yatton.

Nerve and General Medical Cases receive care and skilled nursing, and special attention is given to the Aged and Chronic Cases. Patients can enjoy absolute rest and quiet in the grounds.

Fees from Three Guineas.

EDUCATIONAL OPPORTUNITIES FOR CHILDREN.

Telegrams: "The Court, Blagdon."
Telephone: Post Office, Blagdon.

Matron: MRS HALL, L.N.
THE COURT, BLAGDON, near Bristol.

ROSTREVOR PRIVATE SANATORIUM

Near WARRENPOINT, CO. DOWN.

Specially built in 1899 on well-sheltered site, 350 feet above sea-level. Numerous Verandahs and Revolving Shelters, all provided with Electric Light.

OWN DAIRY AND POULTRY.
Terms on application to the Secretary.

Medical Superintendent: J. A. O'TIERNEY, M.B.

Crown 8vo. Cloth. Fully Illustrated. 2/6 net. Postage 4d.

OPEN-AIR AT HOME: or, Practical Experience of the Continuation of Sanatorium Treatment.

WITH DIRECTIONS FOR FITTING-UP AND FURNISHING THE NECESSARY SHELTER.

By **STANLEY H. BATES.**

"A useful little book, which doctors may recommend patients who are obliged to carry out open-air treatment at home."—*British Medical Journal*.

JOHN WRIGHT & SONS LTD., Publishers, BRISTOL.

Crown 8vo. Cloth, 2/6 net. Postage 3d.

NOTES ON THE TREATMENT OF TUBERCULOSIS.

By **JOHN LAIRD, L.R.C.S. & P.I.**

"The author sets forth his opinions with much argumentative skill. A compact little book containing many sound observations and much good advice."—*British Medical Journal*.

BRISTOL: JOHN WRIGHT & SONS Ltd. London: Simpkin & Co. Ltd.

The ACOMB NURSING HOME,

SPRINGFIELD AVENUE, HARROGATE.



THE Home is devoted entirely to **MATERNITY CASES** conducted under **SCOPOLAMINE-MORPHINE (Twilight Sleep)**, of which the Resident Physician has now had over 600 cases, probably the largest series of cases outside Freiburg. The Home is specially equipped for this work, and no septic cases of any kind are admitted. Expert and Special Staff of Nurses. It is an ideal and luxurious Home for this work.

Apply for particulars to the **MATRON**, or to
W. OSBORNE GREENWOOD, M.D., B.S. (Resident Obstetrician).

MERIVALE SANATORIUM



Opened
1905.

Sandon, Near CHELMSFORD, ESSEX.

The SANATORIUM is situated on the second highest point in Essex, in the neighbourhood of Danbury. The climatic conditions in this part of the country are particularly well suited for the treatment of Tuberculosis. The atmosphere is dry and very bracing, with an abundance of sunshine, and very little rain.

Patients live in specially constructed canvas tents, and it has been found that patients improve far quicker under these conditions than those treated in brick buildings. Each tent is constructed of a stout framework of wood with

canvas sides consisting of movable shutters, which can be opened or closed, and which make it quite impossible for the patient to be in a draught, or for any rain to enter the tent.

As each patient occupies a separate tent, it is possible to regulate and manipulate each tent separately, thus enabling the requirements of each individual patient to be attended to.

The tents give rise to no inconvenience in cold weather. An extra blanket or two, and a hot water bottle are all that are required even in the winter to keep patients comfortably warm.

Chelmsford is 30 miles by rail or road from London. There is a frequent service of fast trains between Liverpool Street and Chelmsford Stations. Taxi-cabs and carriages meet all trains.



FEEES ARE FROM £4 4s. TO £5 5s. PER WEEK. For all Particulars apply to—

Dr. H. NORMAN MARRETT, Resident Physician.

KENLEY HOUSE, Kenley, Surrey, NURSING HOME.



For Ladies and
Gentlemen needing
Rest and Care.

Surgical, Medical
Rest Cure.

Special Care and
Attention given to
Chronic Cases and
the Aged.

Kenley House is
situated under a
mile south-east of
Kenley Station, and
is quite in the
Country, surround-
ed by beautiful
Pleasure Gardens
and Farmery (15
acres). Close to
common with Golf
Course.

References from
Medical Profession
and others.

Terms and further particulars from —
MISS HASLOCK.
Tel. : Putley, 955. Kenley House, Kenley, Surrey.

BOURNEMOUTH, BRANKSOME TOWER HOTEL.

The Hotel Motor-Bus meets all Trains. Telegrams: "BRANKSOME TOWER, BOURNEMOUTH."
Telephone: No. 415. Visitors' Telephone: No. 1974. Station: BOURNEMOUTH WEST.



THIS Fine Old Country Seat has been converted into the most beautiful and luxurious Hotel on the South Coast. Nine acres of grandly timbered grounds extending to sea shore. Self-contained suites, with bath rooms, etc. Almost all the rooms, including the magnificent dining room, drawing room, lounge and verandah, face south and overlook the sea. **Three Tennis Courts, one for winter play, Croquet Lawns, Bowling, etc.** Several Golf Links in the immediate neighbourhood. A large garage with private lock-ups and covered washing yard. Splendid centre for motor runs in the New Forest and the uplands of Dorset. **The sea shore, with its firm, safe sands, is reached without leaving the hotel grounds or crossing a road. Private Promenade with Bungalows on the sea shore.** The hotel is thus an ideal sea-side residence, and is the only Bournemouth hotel possessing these unique advantages. It is sheltered by extensive Pine woods and acres of Rhododendrons, and commands superb views. A long covered verandah facing the sea enables the health-giving air and beautiful scenery to be enjoyed in all weathers. **PATRONISED BY ROYALTY.**

Terms Inclusive or à la Carte. For further particulars please apply to T. LOUIS, Manager.

DR. BARNARDO'S HOMES.



CHARTER :

**"No Destitute Child Ever
Refused Admission."**

MOTTO :

"For God and Country."

**NO RED TAPE.
NO VOTES REQUIRED.**

A FEW FIGURES.

- 90,004** Children have passed through the Rescue Doors.
- 15,515** dealt with last year.
- 7,335** is the average number of Children in residence.
- 460** are Crippled, Incurable, Deaf and Dumb, physically afflicted, or sick.
- 964** Boys and Girls are under Industrial Training.
- 26,633** Young People have been migrated to Canada and the Overseas Dominions. 95 per cent do well.
- 10,715** Barnardo Boys fought for you on land and sea in the Great War.
- 300** Boys are constantly in training for the Navy and and Mercantile Marine.

**It will interest Medical Men to know that the death rate
in the Homes for the year 1919 was only 8·99 per 1000.**

**** Cheques payable "DR. BARNARDO'S HOMES",
and crossed, may be addressed to the Honorary Treasurer,
Howard Williams, Esq., at Head Offices,
18 to 26 STEPNEY CAUSEWAY, LONDON, E. 1.**

THE BRITISH SPA FEDERATION.

The Hot Springs of

BATH

Britain's Radium Spa.

Administered only by trained attendants and the most modern balneo-therapeutic methods at the completely equipped Bathing Establishment. Full programme of Entertainments maintained throughout the year.

Members of the Medical Profession are invited to write to the Director of Baths (JOHN HATTON) for particulars of special arrangements for the profession, medical handbook, and all information. Mr. HATTON will be pleased to be of service in facilitating the visit of any patients ordered to Bath.

See also page 586.

BUXTON

The Mountain Spa.

FIRST-CLASS Thermal Bathing Establishments, with every efficient treatment for the cure of Rheumatism, Gout, Sciatica, Rheumatoid Arthritis, Colitis, and kindred diseases. Radio-Active Natural Mineral Waters 82° F.

BUXTON is the highest town in the United Kingdom.

BEAUTIFUL SCENERY.

BRACING AIR.

THEATRES, MUSIC, DRIVES & TOURS, GARDENS.

COMPLIMENTARY FACILITIES TO MEDICAL MEN.

Specially reduced Tariffs at Hotels, Hydros, etc.

All information from **J. M. SCOTT** (M.A. Dept.) **BUXTON.**

See also page 586

THE BRITISH SPA FEDERATION.

CHELTENHAM SPA

The Carlsbad of England.

CENTRE FOR THE PICTURESQUE COTSWOLD HILLS,
SEVERN & WYE VALES, & SHAKESPEARE COUNTRY.
BEAUTIFUL PROMENADE, SPAS, AND GARDENS.
HUNTING, GOLF, DRIVES, AND TOURS,
MUSIC, THEATRES.

Four Natural Waters * Modern Baths.
EQUABLE CLIMATE.

For Illustrated Handbook, apply

SPA MANAGER, MUNICIPAL OFFICES, CHELTENHAM SPA.

'Phone No. 1001.

See also page 586.

DROITWICH

Visited by
Thousands Annually.

ENGLAND'S BRINE BATHS SPA.

— Recommended at all Seasons. —

World-renowned for Treatment of Rheumatism, Gout, Sciatica,
Rheumatoid Arthritis, Neuralgia, Neuritis, Lumbago, Paralysis, &c.

— Luxurious MODERN BATHS all supplied direct from —

THE NATURAL BRINE SPRINGS.

AERATION BATHS (the newest adaptation of the celebrated French Whirlpool System), and the **NAUHEIM TREATMENT** given on the most approved principles.

The Radio-Active, the Radio-Emanative, and other properties
are only present in the Natural Brine of Droitwich given at
these Baths, for which there is no substitute.

DIRECT route by Great Western Railway from London; also served by Midland Railway.
Convenient from all districts. Picturesque Country. Excellent Roads. Capital centre
for Worcester, Birmingham, Stratford-on-Avon, Broadway, Tewkesbury, Warwick, and
numerous other places of interest. Good Hotels, beautifully laid-out Park, daily Music, Golf,
Fishing, capital Hunting. Further particulars and Illustrated Booklet Free, from—

J. H. HOLLYER (Manager of Baths, &c.), 24 Corbett Estate Offices, Droitwich

SPECIAL FACILITIES TO MEDICAL MEN.

See also page 587.

THE BRITISH SPA FEDERATION.

AT HARROGATE

YOU can depend upon your Patient being able to get any CONTINENTAL SPA TREATMENT, and many others in addition.

The Bathing Waters have been increased in strength by 100 per cent quite recently, and many other important improvements have been effected as the result of the recent scientific survey.

Why not test our claim of superiority over the Continental Spa for yourself by paying us a Visit? You will have a really enjoyable Vacation at the same time.

A medical brochure, list of complimentary facilities, etc., will be sent on request by

F. J. C. BROOME, General Manager, Royal Baths, HARROGATE.

See also page 587.

(A. Dept.)

LEAMINGTON SPA

(OPEN ALL THE YEAR ROUND)

RADIO - ACTIVE SALINE SPRINGS

(Over 100,000 gallons yielded daily).

Especially suitable for the Treatment of Rheumatism, Gout, derangement of digestion, and many Affections of the Skin.

— MILITARY and other BANDS play throughout the Season. —
Exceptional facilities for Hunting, Golf, Tennis, Croquet, etc.

See also page 587.

THE BRITISH SPA FEDERATION.

LLANDRINDOD WELLS

THE PRINCIPAL WELSH SPA.

Practically every form of British and Foreign Spa Treatment. Medicinal Waters—Saline Sulphur, Radium-Sulphur, Magnesium, Chalybeate, &c. Mountain and Lake Scenery. Golf (2 Courses), Tennis, Bowling, Fishing, &c. Finest Hotel Accommodation. Amusements.

For information apply **SECRETARY,**
Joint Advertising Committee, **LLANDRINDOD WELLS.**

See also page 588.

WOODHALL SPA

BROMO-IODINE WATER

For Arthritis, Rheumatism, Gout, Sciatica, Uterine, Skin, and Nervous Diseases, Nose and Throat, and Heart Diseases.

The SPA BATHS Comprise the BROMO-IODINE, MINERAL, VAPOUR, PINE, ELECTRIC, SULPHUR & NAUHEIM BATHS, AIX & VICHY DOUCHE MASSAGE, SCOTCH DOUCHE, NEEDLE DOUCHE, BERTHOLLET VAPOUR, ROOMS for INHALATIONS, FANGO PACKS, LIVER PACKS, the DOWSING HEAT & LIGHT TREATMENT, BERGONIE TREATMENT, PARAFFIN WAX TREATMENT, COMPLETE ELECTRICAL INSTALLATION with SCHNEE BATH, SINUSOIDAL and TRIPHASE CURRENTS, etc. X-RAY, HIGH FREQUENCY, IONIC TREATMENTS, SWEDISH MASSAGE, and VIBRO-MASSAGE.

Mineral Water sold in Large Bottles at 18/- per doz.; Concentrated ("Motherlye") for outward application only, 3/6 and 1/9 per bottle; **Granular Effervescent Salts**, 2 9 per bottle. To be had of all Chemists, or direct from the Spring, on application to the **SECRETARY, WOODHALL SPA CO. Ltd., WOODHALL SPA, LINCOLNSHIRE.**

Accommodation. There are several excellent Hotels, and a list of apartments and boarding houses can be obtained by applying to **The Secretary, Information Bureau, WOODHALL SPA.**
18-hole Golf Links, Tennis and Croquet, Pine Woods.

See also page 533.

THE BRITISH SPA FEDERATION.

NEW ZEALAND Health Resorts.

- ROTORUA** - Unique and wonderful Sulphur Waters.
Luxurious Baths. Special Treatment of Gouty,
Rheumatic, Nerve, and Skin Diseases.
Geysers, Boiling Springs, Thermal Wonders, Pic-
turesque Scenery, excellent Trout fishing; equally
attractive to Invalids, Tourists, and Sportsmen.
- TE AROHA** - Hot Alkaline Waters, twice the strength of Vichy.
- HANMER** - Mild Sulphur Waters; bracing climate.
- MT. COOK** - Magnificent Alpine scenery, guides, climbing.
- MILFORD
SOUND** - Fiords, Lakes, Waterfalls. The track to Milford
Sound has been proclaimed "the finest walk in
the world".
- SEASON** - October to May. Leave England in September, and
get Three Summers running.
- ROUTES** - Via Panama; via the Cape; via Suez; or via Canada.

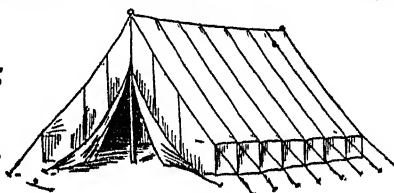
See also page 588.

OPEN AIR TREATMENT.

TENTS

for CONSUMPTIVES
and INVALIDS.

All designs of Garden Shelters,
and Light Weight Tents.



Folding Furniture, Beds, Chairs, Tables, etc.

THOS. BLACK & CO., 25 Cathcart St., GREENOCK

CONTRACTORS TO THE ADMIRALTY and WAR OFFICE.

Third Edition. 8vo. Complete with Sample Chart. 1/6 net. Postage 3d.

CONSUMPTION: TREATMENT AT HOME AND RULES FOR LIVING.

By H. WARREN CROWE, M.D.

By learning these rules, patients may save the practitioner's time, and become grounded in the first elements of their successful treatment.

"Conveys most valuable hints. . . Rules laid down are clear and reliable to the lay mind; a distinct contribution to the anti-tubercular crusade."—*Glasgow Medical Journal*.

BRISTOL: JOHN WRIGHT & SONS Ltd.

London: Simpkin & Co. Ltd.

Valentine's Meat-Juice

In all **Wasting, Acute or Febrile Diseases**, where the **Digestive Organs** are **Impaired**, **Valentine's Meat-Juice** demonstrates its **Ease of Assimilation** and **Power to Sustain and Strengthen**

When Other Food Fails

The quickness and power with which **VALENTINE'S MEAT-JUICE** acts, the manner in which it adapts itself to and quiets the stomach, its agreeable taste, ease of administration and assimilation, have won for it the approval and endorsement of many medical men of Europe, America, etc.



VALENTINE'S MEAT-JUICE CO.

RICHMOND, VIRGINIA, U.S.A.

INSTRUMENTS AND EQUIPMENT FOR

Examination of Ear, Nose & Throat, Operation on Tonsils, Adenoids, Mastoid, Nasal Septum

AS SUPPLIED TO AND USED IN

*Ear, Nose and Throat Department, Royal Infirmary, Edinburgh ;
and the Edinburgh Eye, Ear and Throat Infirmary, etc., etc.*

ARCHD. YOUNG & SON, 57-61 FORREST ROAD,
EDINBURGH.

Surgical Instrument Makers to Royal Infirmary, Edinburgh.

'Phone : Central 669.

Telegrams : "Bandage, Edinburgh," A.B.C. Code, 5th Ed.

11th Edition. 150th Thousand. Fully Revised. 301 Illustrations. (9 in Colour.)
Suff Boards, 2/9 net. Limp Leather, 5/3 net. Post Free.

"FIRST AID" TO THE INJURED AND SICK.

AN ADVANCED AMBULANCE HANDBOOK.

By F. J. WARWICK, B.A., M.B., M.R.C.S., L.S.A., A.K.C.(Lond.),
and
A. C. TUNSTALL, M.D., C.M., F.R.C.S., L.R.C.P.(Edin.).

"We can say without hesitation it is one of the most concise works on the subject published at a popular price."—*First Aid Journal*.

"Has already taken its place as a standard work."—*British Medical Journal*.

Fifth Edition. On Sheets 3ft. 4in. by 2ft. 2in. 2/6 each net ; 42/- net the set of 19,
with head roller, Postage 1/- ; or mounted on linen, 70/- net. Postage 1/-.

Fully Illustrated Prospectus on application.

Large Sheet 'First Aid' WALL DIAGRAMS

Being Enlargements of the Illustrations in "First Aid to the Injured and Sick", suitable for Lectures and Classes.

Sheets A, B, C, D, E, F, G.—Anatomy and Physiology. H, I, J.—The Triangular Bandage. K, L.—Roller Bandage. M, N.—Hæmorrhage and Wounds. O, P.—Dislocations and Fractures. Q, R.—Transport. S.—Artificial Respiration.

14th Edition. Fully Revised. Pocket Size. Numerous Illustrations.
Cloth, 3/6 net. Postage 3d.

Pye's Elementary Bandaging and Surgical Dressing.

Revised from Mr. W. H. CLAYTON-GREENE'S 8th Edition of
PYE'S SURGICAL HANDICRAFT.

By V. ZACHARY COPE, B.A., M.D., M.S. Lond., F.R.C.S. Eng.,
Surgeon-in-Charge of Out-patients, St. Mary's Hospital.

"A portable and complete guide to the proper management of emergency cases, and the best and easiest methods of bandaging and applying splints. The directions given are clear and practical, showing the guidance of experience."—*Scottish Medical and Surgical Journal*.

ristol : John Wright & Sons Ltd.

London : Simpkin & Co. Ltd.

KEROL

DISINFECTANT and ANTISEPTIC Preparations.

It has been shown that **KEROL** is 60 times less toxic than pure phenol when its germicidal power is taken into consideration (vide *The Medical Times*, June 28, 1908). This fact, coupled with its non-corrosive and non-irritant action, makes it the most perfect antiseptic for internal administration. It has been used very extensively during the past few years in all forms of Alimentary Toxæmia with the most excellent results. The coli content of the intestine is reduced by 99% when **KEROL** in the form of capsules has been administered for ten days (*The Medical Press*, January 14, 1914), and when compared with other "so-called" intestinal antiseptics, these results are worthy of the greatest consideration by the medical profession.

Salol and Beta-naphthol fail to reduce the intestinal flora when given in maximum doses for ten days, and Stern in some of his work shows that the only effective antiseptic was calomel, which, owing to its strongly purgative action is quite unsuitable for general use.

The Indications for the use of **KEROL** are as follows:—

INTERNAL :

Intestinal Capsules.

- Intestinal Flatulence and Fermentation.
- Auto-intoxication.
- Rheumatoid Arthritis where Intestinal Infection is suspected.
- Osteo Arthritis.
- Chronic Rheumatism.
- Intestinal Stasis. Anæmia.
- Neurasthenia with intestinal symptoms due to Auto-intoxication.
- Neuritis.
- Asthma.
- Coli Infection, Cystitis, Cholecystitis, Salpingitis, due to B. Coli Infection.
- Coli Bacilluria and Nocturnal Enuresis.
- Infective Enteritis, Diarrhoea, Dysentery, Ptomaine Poisoning, Food Poisoning, Urticaria.
- Typhoid Fever.

Colitis.
Carcinoma (Intestinal or Gastric).
Tubercular Enteritis and Peritonitis, Tubes Mesenterica.
Appendicitis and Perityphilitis (chronic).
Intestinal Operations, Preparatory Treatment.
High Blood Pressure.
Indicanuria as a sign of excessive Intestinal Putrefaction.

Gastric Capsules.

Ptomaine Poisoning.
Food or Fish Poisoning.
Urticaria.
Neurasthenia with Symptoms of defective digestion.
Dilatation of Stomach with Gastric Atony.
Flatulence, Amylaceous Indigestion.
Carcinoma of Stomach or Pylorus.
Gastric Operations, Preparatory Treatment.

EXTERNAL :

Kerol (Medical).

- Disinfection of hands, instruments, skin, etc.
- Cleansing septic cavities.
- Disinfection of Typhoid stools and Tubercular Sputum.
- Whenever a reliable, powerful, and non-corrosive antiseptic is required externally.

Lano-Kerol.

Tinea Tonsurans.
Syrosis barbae.
Obstinate Impetigo.
Pruritus.
Pediculi and any condition requiring an antiseptic ointment equal in strength to **100 per cent. pure Carbolic Acid**.
Burns—after the first dressing.

The Manufacturers will have much pleasure in forwarding recent literature and samples to any member of the Medical Profession on receipt of a post-card.

QUIBELL BROTHERS, Ltd. Manufacturing Chemists. NEWARK, ENGLAND.



Ready in a moment !

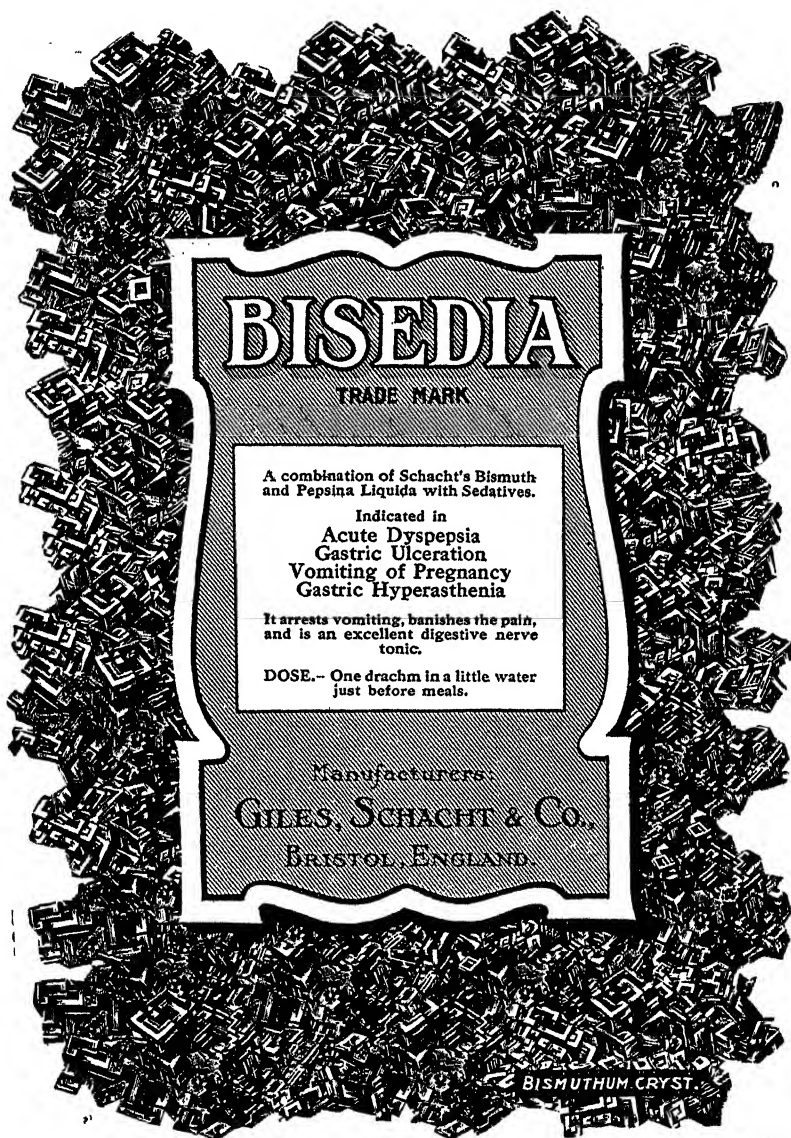
Combining, as OXO does, the stimulating and nourishing properties of beef, it is a safe stimulant in emergency—and ready in a moment.

Directly OXO is taken its nutrients are distributed to every part of the system. Its effect is unique; it nourishes, strengthens and builds up health.

On account of its handiness and economy, and its dietetic superiority over Beef Tea, OXO is being recommended more than ever by Medical men for use in Hospitals and Public Institutions.

Better than Beef Tea.

1
 2
 3
 4
 5
 6
 7
 8
 9
 10
 11
 12
 13
 14
 15
 16
 17
 18
 19
 20
 21
 22
 23
 24
 25
 26
 27
 28
 29
 30
 31
 32
 33
 34
 35
 36
 37
 38
 39
 40
 41
 42
 43
 44
 45
 46
 47
 48
 49
 50
 51
 52
 53
 54
 55
 56
 57
 58
 59
 60
 61
 62
 63
 64
 65
 66
 67
 68
 69
 70
 71
 72
 73
 74
 75
 76
 77
 78
 79
 80
 81
 82
 83
 84
 85
 86
 87
 88
 89
 90
 91
 92
 93
 94
 95
 96
 97
 98
 99
 100
 101
 102
 103
 104
 105
 106
 107
 108
 109
 110
 111
 112
 113
 114
 115
 116
 117
 118
 119
 120
 121
 122
 123
 124
 125
 126
 127
 128
 129
 130
 131
 132
 133
 134
 135
 136
 137
 138
 139
 140
 141
 142
 143
 144
 145
 146
 147
 148
 149
 150
 151
 152
 153
 154
 155
 156
 157
 158
 159
 160
 161
 162
 163
 164
 165
 166
 167
 168
 169
 170
 171
 172
 173
 174
 175
 176
 177
 178
 179
 180
 181
 182
 183
 184
 185
 186
 187
 188
 189
 190
 191
 192
 193
 194
 195
 196
 197
 198
 199
 200
 201
 202
 203
 204
 205
 206
 207
 208
 209
 210
 211
 212
 213
 214
 215
 216
 217
 218
 219
 220
 221
 222
 223
 224
 225
 226
 227
 228
 229
 230
 231
 232
 233
 234
 235
 236
 237
 238
 239
 240
 241
 242
 243
 244
 245
 246
 247
 248
 249
 250
 251
 252
 253
 254
 255
 256
 257
 258
 259
 260
 261
 262
 263
 264
 265
 266
 267
 268
 269
 270
 271
 272
 273
 274
 275
 276
 277
 278
 279
 280
 281
 282
 283
 284
 285
 286
 287
 288
 289
 290
 291
 292
 293
 294
 295
 296
 297
 298
 299
 300
 301
 302
 303
 304
 305
 306
 307
 308
 309
 310
 311
 312
 313
 314
 315
 316
 317
 318
 319
 320
 321
 322
 323
 324
 325
 326
 327
 328
 329
 330
 331
 332
 333
 334
 335
 336
 337
 338
 339
 340
 341
 342
 343
 344
 345
 346
 347
 348
 349
 350
 351
 352
 353
 354
 355
 356
 357
 358
 359
 360
 361
 362
 363
 364
 365
 366
 367
 368
 369
 370
 371
 372
 373
 374
 375
 376
 377
 378
 379
 380
 381
 382
 383
 384
 385
 386
 387
 388
 389
 390
 391
 392
 393
 394
 395
 396
 397
 398
 399
 400
 401
 402
 403
 404
 405
 406
 407
 408
 409
 410
 411
 412
 413
 414
 415
 416
 417
 418
 419
 420
 421
 422
 423
 424
 425
 426
 427
 428
 429
 430
 431
 432
 433
 434
 435
 436
 437
 438
 439
 440
 441
 442
 443
 444
 445
 446
 447
 448
 449
 450
 451
 452
 453
 454
 455
 456
 457
 458
 459
 460
 461
 462
 463
 464
 465
 466
 467
 468
 469
 470
 471
 472
 473
 474
 475
 476
 477
 478
 479
 480
 481
 482
 483
 484
 485
 486
 487
 488
 489
 490
 491
 492
 493
 494
 495
 496
 497
 498
 499
 500
 501
 502
 503
 504
 505
 506
 507
 508
 509
 510
 511
 512
 513
 514
 515
 516
 517
 518
 519
 520
 521
 522
 523
 524
 525



BISEDIA
TRADE MARK

A combination of Schacht's Bismuth
and Pepsina Liquida with Sedatives.

Indicated in
Acute Dyspepsia
Gastric Ulceration
Vomiting of Pregnancy
Gastric Hyperasthenia

It arrests vomiting, banishes the pain,
and is an excellent digestive nerve
tonic.

DOSE.— One drachm in a little water
just before meals.

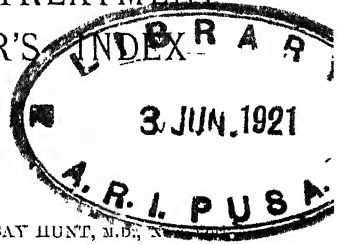
Manufacturers:
GILES, SCHACHT & Co.,
BRISTOL, ENGLAND.

BISMUTHUM CRYST.

THE

MEDICAL ANNUAL:

A YEAR BOOK OF TREATMENT
AND PRACTITIONER'S INDEX



Contributors:

FRED H. ALBEE, M.D., Sc.D., F.A.C.S., New York
E. WYLLIS ANDREWS, F.A.C.S., A.M., M.D.,
Chicago
JOSEPH BLOMFIELD, O.B.E., B.A., M.D.
JOHN BURDON-COOPER, B.Sc., M.D., F.R.C.S.
R. F. CARTER, M.D., New York
FRANCIS J. CHARTERIS, M.D., B.Ch.
JOHN D. COMRIE, M.A., M.D., F.R.C.P.
CAREY F. COOMBS, M.D., F.R.C.P.
WILLIAM E. FOTHERGILL, M.A., M.D.
JOHN S. FRASER, M.B., Ch.B., F.R.C.S.
HERBERT FRENCH, M.A., M.D., F.R.C.P.
O. C. GRUNER, M.D.
J. A. HADFIELD, M.A., M.B., Ch.B.
COL. L. W. HARRISON, D.S.O., M.B., Ch.B.,
M.R.C.P.
C. THURSTAN HOLLAND, M.R.C.S., L.R.C.P.

J. RAMSAY HUNT, M.D., F.R.C.P.
ROBERT HUTCHINSON, M.D., F.R.C.P.
FREDERICK LANGMEAD, M.D., F.R.C.P.
ARTHUR LATHAM, M.A., M.D., F.R.C.P.
E. G. GRAHAM LITTLE, M.D., F.R.C.P.
J. P. LOCKHART-MUMMEY, M.B., F.R.C.S.
J. A. NIXON, C.M.G., M.D., F.R.C.P.
BEDFORD PIERCE, M.D., F.R.C.P.
JOSEPH PRIESTLEY, B.A., M.D., D.Phil.
SIR LEONARD ROGERS, C.B.E., Lt.-Col. R.M.S.,
M.D., F.R.C.P., F.R.C.S., Calcutta
J. D. ROLLISTON, M.A., M.D.
JAMES SHERRIN, C.B.E., F.R.C.S.
J. W. THOMSON WALKER, M.D., F.R.C.S.
SIR W. L. DE C. WHEELER, B.A., M.D., F.R.C.S.
MARGUERITE WILSON, M.B., Ch.B.
ANDREW J. M. WRIGHT, M.B., F.R.C.S.

Associate Editors: {CAREY F. COOMBS, M.D., F.R.C.P. (Medicine)
{A. RENDLE SHORT, M.D., B.S., B.Sc., F.R.C.S. (Surgery)

THIRTY-NINTH YEAR.

1921

BRISTOL: JOHN WRIGHT & SONS LTD.
LONDON: SIMPKIN, MARSHALL, HAMILTON, KENT & CO. LTD.
NEW YORK: WILLIAM WOOD & CO.; TORONTO: THE J. F. HARTZ CO. LTD.
CALCUTTA: THACKER, SPINK & CO; BUTTERWORTH & CO. (INDIA) LTD.
BOMBAY: W. THACKER & CO.
MELBOURNE: W. RAMSAY. SYDNEY: ANGUS & ROBERTSON LTD.
NEW ZEALAND: WHITCOMBE & TOMES LTD.

Contributors and Original Contributions to Medical Annual, 1921

FRED H. ALBEE, M.D., Sc.D., F.A.C.S., New York, Professor and Director of Orthopædic Surgery at the New York Post-Graduate Medical School and at the University of Vermont; Consulting Surgeon to the Pennsylvania Railroad System; Member of the Advisory Orthopædic Council to the Surgeon-General; and

R. F. CARTER, M.D., Resident Surgeon, New York Post-Graduate Hospital.
(*Orthopædic Surgery*.)

Orthopædic Surgery—515.

E. WYLLYS ANDREWS, F.A.C.S., A.M., M.D., CHICAGO, Professor of Surgery, North West Medical School; Surgeon to Cook County Hospital, Mercy Hospital, and Michael Reese Hospital, Chicago.
(*Abdominal Surgery*.)

Abdominal Surgery—40. Appendix, Surgery of—57. Gall-bladder and Bile-passages, Surgery of—204. Hernia, Femoral—245. Hernia, Inguinal—245. Intestines, Surgery of—267. Pancreas, Surgery of—356.

JOSEPH BLOMFELD, O.B.E., M.D., Senior Anæsthetist and Lecturer on Anæsthetics, St. George's Hospital.
(*Anæsthesia*.)

Anæsthesia—48.

J. BURDON-COOPER, B.Sc., M.D., F.R.C.S., D.O. Oxon., Senior Surgeon, Bath Eye Infirmary; Lecturer on Physiological Optics, Department of Ophthalmology, University of Oxford.
(*Eye Diseases*.)

Cataract—91. Conjunctiva, Diseases of—121. Eye Diseases, Focal Infection in relation to—191. Eye, Enucleation of—193. Eye, General Affections of—195. Eye, General Therapeutics of—198. Glaucoma—214. Retina, Diseases of—397.

FRANCIS J. CHARTERIS, M.D., B.Ch., Professor of Materia Medica, St. Andrews University; Extra Physician, Royal Infirmary, Dundee.
(*Materia Medica and Therapeutics*.)

Dictionary of Remedies—1. Colloidal Drugs—9. Continuous Intravenous Infusion—12. Protein Therapy—18. Vaccines—22.

JOHN D. COMRIE, M.A., B.Sc., M.D., F.R.C.P. Ed., Lecturer on History of Medicine and Clinical Medicine, University of Edinburgh; Assistant Physician, Royal Infirmary, Edinburgh.
(*Renal and Urinary Diseases*.)

Diabetes Insipidus—145. Diabetes Mellitus—145. Kidney Function Tests—271. Nephritis—334.

CAREY F. COOMBS, M.D., F.R.C.P., Physician (with Charge of Out-patients) Bristol General Hospital; Honorary Consulting Physician for Diseases of the Heart, Ministry of Pensions (S.W. Region).
(*Diseases of the Heart and Blood-vessels*.)

Aneurysm, Aortic—54. Arterial Tension, High—58. Endocarditis, Subacute Bacterial—182. Heart Disease—237. Heart, Irritable—243. Pericarditis—311. Syphilis, Cardiovascular—452.

WM. E. FOTHERGILL, M.A., B.Sc., M.D., Hon. Gynæcological Surgeon, Manchester Royal Infirmary; Hon. Surgeon, St. Mary's Hospital for Women; Professor of Obstetrics and Gynæcology, Victoria University, Manchester. (*Gynæcology and Obstetrics.*)

Labour—284. Pregnancy, Disorders of—368. Uterus, Disorders of—500. Vulva, Diseases of—512.

JOHN S. FRASER, M.B., Ch.B., F.R.C.S.Ed., Assistant Surgeon, Ear, Nose, and Throat Department, Royal Infirmary, Edinburgh; Lecturer on Diseases of the Ear, Nose, and Larynx, Edinburgh University. (*Diseases of the Ear.*)

Deafness and Deaf-mutism—127. Ear Disease, Intracranial Complications—157. Ear, External, Affections of—162. Ear, Inner, Affections of—163. Hearing, Mechanism of—236. Mastoid Disease—300. Otitis Media—350. Otosclerosis—352.

HERBERT FRENCH, C.B.E., M.A., M.D.Oxon., F.R.C.P., Physician to H.M. Household; Physician and Lecturer, Guy's Hospital; Consulting Physician to Queen Alexandra's Military Hospital, Millbank; and to the Radium Institute, London. (*General Medicine.*)

Hæmophilia—234. Hydatid Cysts—247. Jaundice, Hæmorrhagic—270. Sea-sickness—406. Tuberculosis of the Spleen—480.

O. C. GRUNER, M.D.Lond., M.R.C.S., Hon. Demonstrator of Pathology, Leeds Medical School; late Pathologist, Royal Victoria Hospital, Montreal. (*Clinical Pathology.*)

Anæmia—48. Bacterial Life-cycles—62. Blood, Bacteriology of—71. Blood, Chemistry of—71. Blood, Coagulation Time of—74. Blood, Cytology of—75. Blood-platelets—81. Cancer, Clinical Pathology of—90. Cerebrospinal Fluid—105. Diphtheria—154. Ductless Glands—155. Fæces, Examination of—201. Gall-stones, Clinical Pathology of—206. Gastric Analysis—206. Immunity Reactions—248. Leucocytosis—288. Malaria—299. Pancreas, Clinical Pathology of—353. Paratyphoid Fever—359. Pleural Effusion, Clinical Pathology of—364. Respiratory Function, Clinical Studies of—396. Sputum, Examination of—428. Sterilization—429. Tubercle Bacilli in Tissues—474. Urine, Clinical Pathology of—494.

JAMES A. HADFIELD, M.A., M.B., Ch.B.Ed. (*Psychological Medicine.*)
Psychological Medicine—373.

L. W. HARRISON, D.S.O., M.B., Ch.B., M.R.C.P.E., Brevet-Col. R.A.M.C., and King's Honorary Physician (Retired); Director of Venereal Diseases Department, St. Thomas's Hospital. (*Venereal Diseases.*)

Chancroid—109. Gonorrhœa—224. Syphilis—445. Syphilis of the Central Nervous System—453.

CHAS. THURSTAN HOLLAND, M.R.C.S., L.R.C.P., Lecturer on Radiology in the University of Liverpool; Hon. Medical Officer, Electrical Department, and Director, Orthopædic Department, Royal Infirmary, Liverpool; Hon. Medical Officer, X-Ray Department, Liverpool Children's Infirmary. (*Radio-activity and Electrotherapeutics.*)

Radiography, Radio-activity, and Electrotherapeutics—24. X-ray Diagnosis—25. Radiotherapy—33. Electrotherapeutics—35.

. RAMSAY HUNT, M.D., NEW YORK, Consulting Neurologist, New York Hospital, Neurological Institute, Letchworth Village for Mental Defectives, and the Craig Colony for Epileptics. (*Diseases of the Nervous System.*)

Causalgia—96. Cerebellar Symptomatology and Localization—98. Cerebral Tumours—99. Cranial Surgery—123. Encephalitis Lethargica—171. Enteritis, Acute Infectious—184. Epilepsy—185. The Geniculate Ganglion Syndrome—213. Meningitis, Serous Spinal—310. Meningitis, Tuberculous—312. Motility, Disorders of—325. Myoclonus Multiplex—329. Nerves, Peripheral, Surgery of—338. Neuralgia—343. Polio-encephalomyelitis, Acute—367. Sciatica—404. Sclerosis, Multiple—405. Spinal Surgery—423. Urological Findings in Diseases of the Central Nervous System—498. Vertigo—511.

ROBERT HUTCHISON, M.D., F.R.C.P., Physician, London Hospital;
Physician, Hospital for Sick Children, Great Ormond Street, London.
(*Gastro-intestinal Disorders.*)

Colon, Mobile—119. Gastric and Duodenal Ulcer—209. Intestinal Toxæmia—265. Pancreas, Diagnosis of Diseases of—353.

FREDK. LANGMEAD, M.D., F.R.C.P., Physician in Charge of Out-patients,
St. Mary's Hospital; Assistant Physician, Hospital for Sick Children,
Great Ormond Street, London. (*Medical Diseases of Children.*)

Amaurotic Family Idiocy—44. Cerebral Hæmorrhage in the New-born—99. Children, Fever in—111. Children, Gastro-intestinal Disorders in—111. Children, Urinary Disorders in—113. Chorea—115. Dental Sepsis in Children—143. Infancy, Intravenous Injections in—249. Infant Feeding—249. Infantile Diarrhea and Vomiting—253. Pharyngospasm—362. Spasmophilia—421. Syphilis, Inherited—456. Thrush—468. Whooping-cough—513.

ARTHUR LATHAM, M.A., M.D. Oxon., F.R.C.P., Physician and Lecturer on
Medicine, St. George's Hospital. (*Pulmonary Diseases.*)

Asthma, Bronchial, and Hay Fever—60. Bronchiectasis—84. Bronchitis, Chronic—85. Lung, Abscess of—290. Lung, Acute Oedema of—290. Pleurisy—365. Pneumonia—365. Tuberculosis, Pulmonary—474.

E. G. GRAHAM LITTLE, M.D., F.R.C.P., Physician for Diseases of the Skin,
St. Mary's Hospital and East London Hospital for Children; Lecturer on
Dermatology, St. Mary's Hospital Medical School. (*Skin Diseases.*)

Carbuncle—91. Chilblains—110. Delhi Boil—139. Dermatitis—144. Eczema—168. Epithelioma, Benign Cystic, with Xeroderma Pigmentosum—191. Erythema Nodosum—191. Favus—202. Furunculosis—204. Granuloma Venereum—231. Herpes Zoster—247. Keloid—274. Kerion of Celsus—274. Lice and Nits—288. Lichen Nitidus—289. Lichen Planus—289. Lupus Vulgaris—290. Madura Foot—294. Noma—348. Pemphigus Vegetans—361. Psoriasis—372. Purpura Annularis Telangiectodes—390. Rhinophyma—399. Ringworm—399. Rodent Ulcer—400. Scabies—400. Scleroderma—405. Seborrhœa—406. Skin Diseases, General—407. Skin, General Therapeutics of—417. Sweating of Feet—444. Syccosis Barbe—445. Ulcer of the Leg—488. Veldt Sore—510. Warts—513.

J. P. LOCKHART-MUMMIERY, M.B., F.R.C.S., Senior Surgeon, St. Mark's
Hospital; Consulting Surgeon, Queen's Hospital for Children, Hackney;
Special Surgeon for Diseases of the Bowel, Homerton and Fulham Military
Hospitals. (*Surgery of the Rectum.*)

Anus, Tuberculosis of—56. Coccydynia—118. Colostomy—120. Hæmorrhoids Internal—235. Rectal Disease, Diagnosis of—392. Rectum, Cancer of 393. Rectum, Foreign Bodies in—394. Rectum, Stricture of—394.

JOHN A. NIXON, C.M.G., M.D., F.R.C.P., Physician to the Royal Infirmary,
Bristol; Consulting Physician to Southmead Infirmary.
(*Deficiency Diseases*)

Deficiency Diseases 131.

BEDFORD PIERCE, M.D., F.R.C.P., Medical Superintendent, The Retreat,
York; Late Lecturer on Mental Diseases, University of Leeds; and

MARGUERITE WILSON, M.B., Ch.B., Assistant Medical Officer, The Retreat,
York. (*Mental Diseases*)

Dementia Præcox—139. Melancholia, Involutional—307. Mental Deficiency—313. Mental Diseases—315. Mental Troubles of Syphilis—323.

JOSEPH PRIESTLEY, B.A., M.D., D.P.H., Medical Officer of Health for
Metropolitan Borough of Lambeth; Lecturer, Royal Sanitary Institute.
(*Public Health*)

Industrial Health—249. Infectious Diseases Prevention—255. Maternity Child Welfare—304. Public Health Administration—388. School Medical vice—403.

SIR LEONARD ROGERS, C.I.E., Lt.-Col. I.M.S., M.D., F.R.C.P., F.R.C.S., F.R.S., Physician and Lecturer, London School of Tropical Medicine; late Professor of Pathology, Medical College, Calcutta.

(*Tropical Diseases.*)

Amoebiasis—45. Ankylostomiasis—55. Bilharziasis—64. Blackwater Fever—65. Bronchial Spirochaetosis—83. Cholera—114. Dengue 143. Dysentery, Bacillary—156. Filariasis—202. Fungi, the Higher, in Human Diseases 203. Kala-azar—273. Leprosy—286. Malaria—295. Relapsing Fever—395. Sprue 428. Tick Fever—468. Trypanosomiasis—473. Yaws—515. Yellow Fever 515.

JOHN D. ROLLESTON, M.A., M.D. Oxon., Senior Assistant Medical Officer, Grove Hospital.

(*Acute Infectious Diseases.*)

Cerebrospinal Fever—107. Diphtheria—151. Influenza—259. Jaundice, Infective—271. Measles—306. Mumps—327. Paratyphoid Fever—358. Scarlet Fever—401. Serum Sickness—407. Small-pox—420. Trench Fever—472. Typhoid Fever—482. Typhus Fever—486. Vaccination—506. Varicella—506.

JAMES SHERRIN, C.B.E., F.R.C.S., Surgeon to London Hospital.

(*Gastric Surgery.*)

Stomach, Surgery of—429.

J. W. THOMSON WALKER, M.B., F.R.C.S., Senior Urologist and Lecturer on Urology, King's College Hospital; Surgeon to St. Peter's Hospital.

(*Urinary Surgery.*)

Bladder, Diseases of—66. Kidney, Surgery of—277. Prostate, Surgery of—369. Testicles, Diseases of—458. Ureter, Surgery of—489. Urethra, Diseases of—492.

SIR W. IRELAND DE COURCY WHEELER, M.D., F.R.C.S.I., Vice-President, Royal College of Surgeons, Ireland; Visiting Surgeon, Mercer's Hospital, Dublin.

(*General Surgery.*)

Breast, Surgery of—82. Burns—86. Cancer—89. Cervical and First Dorsal Ribs—107. Clavicle, Sarcoma of—117. Cleft Palate and Hare-lip—118. Embolism, Pulmonary—170. Exostoses, Benign—191. Goitre, Surgical Aspects of—220. Hæmangiomas and Lymphangiomas—233. Jaw, Fractures of—272. Lymphosarcoma and Hodgkin's Disease—294. Parotitis, Suppurative—360. Ranula—391. Skin-grafting—419. Suppuration, Local—444. Thorax, Surgery of—462. Tongue, Cancer of—469. Tuberculous Abscess—480. Vascular Surgery—507.

A. J. M. WRIGHT, M.B., F.R.C.S., Surgeon in Charge of Nose and Throat Department, Bristol General Hospital; Rhinologist, Bristol Eye Hospital.

(*Diseases of Nose and Throat.*)

Bronchoscopy and Oesophagoscopy—85. Larynx, Cancer of—285. Nasal Accessory Sinuses—331. Nose, Diseases of—348. Ozena—352. Pharynx, Cancer of—362. Tonsils, Diseases of—470. Tracheotomy—471.

CONTENTS

	PAGES
CONTRIBUTORS AND LIST OF SUBJECTS - - - - -	lvii-lx
LIST OF PLATES AND ILLUSTRATIONS - - - - -	lxiii-lxiv
GENERAL INDEX - - - - -	lxv-xciii
INTRODUCTION - - - - -	xciii-eviii

PART I.—MATERIA MEDICA AND THERAPEUTICS.

DICTIONARY OF REMEDIES - - - - -	1-23
RADIOGRAPHY, RADIO-ACTIVITY, AND ELECTROTHERAPEUTICS - - -	24-39

PART II.—THE DICTIONARY OF TREATMENT.

A REVIEW OF MEDICAL AND SURGICAL PROGRESS FOR 1920, BY MANY CON- TRIBUTORS - - - - -	40-537
---	--------

PART III.—MISCELLANEOUS.

EDITOR'S TABLE—NEW INVENTIONS AND PREPARATIONS - - -	538-57
BOOKS OF THE YEAR - - - - -	558-69
ESTABLISHMENTS FOR THE TREATMENT OF MENTAL DISEASES - - -	570-7
INSTITUTIONS UNDER THE MENTAL DEFICIENCY ACT, 1913 - - -	577-80
INSTITUTIONS FOR INEBRIATES - - - - -	580-1
SANATORIA FOR TUBERCULOSIS - - - - -	581-3
HYDROPATHIC ESTABLISHMENTS - - - - -	581
NURSING INSTITUTIONS AND HOMES - - - - -	585-1
PRINCIPAL BRITISH SPAS - - - - -	586-9
OFFICIAL DIRECTORY - - - - -	591-
EDUCATIONAL VACCINATION STATIONS - - - - -	591
MEDICAL AND SCIENTIFIC SOCIETIES, AND PERIODICALS - - -	594
MEDICAL TRADES DIRECTORY - - - - -	597-6
PRIVATE NOTES AND ADDRESSES, AND CALENDAR - - - - -	605
INDEX TO ADVERTISEMENTS - - - - -	607
LIFE ASSURANCE OFFICES, LIST OF - - - - -	615

List of Illustrations

PLATES

	PAGE
PLATE I.—Piric's ossicle (<i>skiagram</i>)	30
PLATE II.—The bone of Vesalius : at the base of the fifth metatarsal (<i>skiagram</i>)	31
PLATE III.—Köhler's disease of the scaphoid (<i>skiagram</i>)	31
PLATE IV.—Abnormality of ossification in bones of hands (<i>skiagram</i>)	31
PLATE V.—Abnormality of patellæ (<i>skiagram</i>)	31
PLATES VI, VII.—Syphiloma of the bladder (<i>coloured</i>)	66-67
PLATE VIII.—Schema showing mode of development of cells of circulating blood (<i>coloured</i>)	76
PLATE IX.—Schema showing the part played by the blood-cells in nutrition (<i>coloured</i>)	78
PLATE X.—Schema showing the inter-relations of the blood-cell-forming organs—the so-called reticulo-endothelial system (<i>coloured</i>)	79
PLATES XI-XIII.—Localization of cerebral tumours by ventriculography (<i>skiagrams</i>)	100
PLATES XIV, XV.—Delhi boil (<i>coloured</i>)	138-9
PLATE XVI.—Meningitic neurolabyrinthitis	164
PLATES XVII, XVIII.—Tumours of eighth cranial nerve	165
PLATE XIX.—Macular keratitis	196
PLATE XX.—Goitre	222
PLATE XXI.—Large compact hæmangioma of the neck	233
PLATES XXII, XXIII.—Diverticulitis	268
PLATE XXIV.—Cutaneous leishmaniasis resembling epithelioma	274
PLATE XXV.—An unusual case of keloid	275
PLATES XXVI-XXIX.—Suprapubic prostatectomy	370-1
PLATE XXX.—Congenital multilocular cysts of the retina (<i>coloured</i>)	397
PLATES XXXI-XXXIII.—Gunshot wounds of the spinal cord (<i>coloured</i>)	422
PLATES XXXIV, XXXV.—Spinal tumours	423
PLATE XXXVI.—Multiple polypoid adenoma	430
PLATE XXXVII.—Congenital hypertrophic pyloric stenosis	431
PLATE XXXVIII.—Treatment of hour-glass stomach	442
PLATE XXXIX.—Cancer of the tongue (<i>coloured</i>)	469
PLATE XL.—Alkaline phosphate crystals in urine	495

ILLUSTRATIONS

FIGS.	PAGE
1.—Transplantation of portion of hairy scalp	45
2.—Amaurotic family idiot, 10 months old	4
3.—Apparatus for administering carbon dioxide	5
4.—Relationship of pelvic appendix to the obturator internus muscle	5
5.—Bacterial life-cycle	(
6.—Chart illustrating glucose tolerance tests	8
7.—Chart illustrating blood-sugar tolerance in health and hyperthyroidism	11

FIGS.	PAGE
8.—The units concerned in splenic anæmia and other diseases of the spleen	80
9.—Coin-catcher caught under edge of cricoid cartilage	86
10.—Ravaut and Boyer's albuminometer for cerebrospinal fluid	106
11-14.—Operation for removal of the first rib	108
15, 16.—Position of patient's head in operation for cleft palate and hare-lip	118
17, 18.—Colostomy, new method of performing	120
19.—Common route of infection in head wounds	124
20.—The Ayrshire family tree of deaf-mutes	128
21-26.—Dimitry's operation in evisceration of sclera	194
27.—Relationship of bile-duct to intestinal wall and to lumen of bowel immediately after operation	205
28.—Localized hypertrophy of liver—the 'langnette hépatique'	205
29.—Normal fractional test meal (<i>milk</i>)	207
30.—Fractional test meal in a case of duodenal ulcer	207
31.—Visual field (R. E.) showing Roenne's step and Bjerrum's sign	218
32.—Seidel's sign	218
33.—Elliot's sign of glaucoma, before and after operation	218
34.—Equipment for tourniquet operation in goitres	222
35.—Electrocardiogram	239
36.—La Roque's method in inguinal hernia	246
37.—Linnartz's stitch for closing inguinal hernia	246
38.—Ricketts' method of intestinal anastomosis by invagination	268
39.—The use of the rubber tube in colonic surgery (Balfour)	269
40.—Autogenous dowel graft inserted in ununited fracture of jaw	272
41.—Incision in cases of fractured jaw	272
42.—Freer's radium applicator in place in the larynx	286
43.—Treatment of malignant tumours of the antrum	333
44.—Normal blood taken at hourly intervals after a test-breakfast	353
45.—Blood from a case of chronic pancreatitis, with a gastric ulcer invading the pancreas, taken at hourly intervals after a test-breakfast	353
46-49.—Trotter's lateral pharyngotomy	363
50.—Relationship of the suboccipital and great occipital nerves to the posterior arch of the atlas	425
51.—Schematic representation of the transmission of force through the occipital condyles to the atlas, axis, and vertebral column	426
52.—Atlas viewed from above to show the result of 'spreading', the bony arch yielding at its weak points	427
53.—Separation of the great omentum from the transverse colon	432
54-56.—Rammstedt's operation in congenital hypertrophic pyloric stenosis. Tyrrell Gray's knife and separator	436
57.—Tracheotomy: injection of cocaine within the lumen of the trachea	471
58.—Rosenbloom's urinometer	497
59-69.—Bone-grafting in the treatment of fractures	516-24
70-75.—Operative treatment of irreducible paralytic dislocation of hip-joint	526-27
76-80.—Physiological treatment of flat-foot	527
81-84.—Treatment of hallux valgus and rigidus	528
85.—Splint and posture in treatment of brachial birth palsy	531
6-134.—Illustrating recent medical and surgical appliances	543-57

General Index :

The more important articles are in heavy type.

	PAGE		PAGE
A BDOMEN, acute, treatment of ..	40	Agalactia, placenta substance tablets in ..	511
Abdominal operations, men's belt for use after ..	515	Air-passages, upper, anaesthesia in operations on ..	19
relieves ..	41	Albumin test for sputum in tuberculosis ..	128, 175
Abdominal Surgery ..	40	— in urine, tests for ..	196
— pseudomyxoma peritonei ..	40	Alcohol in diabetes mellitus ..	148
— splenectomy in rats ..	41	— drops in stenosis of external auditory meatus ..	165
Abscess of brain, surgical treatment of ..	124	— and industrial conditions ..	249
chronic, of prostate ..	372	— injections in treatment of trigeminal neuralgia ..	315
— of lung ..	290	— intracranial injection of 60 per cent of, in caustic ..	97
— and bronchiectasis ..	167	Alkaline mineral water for washing out stomach in typhus ..	168
— in surgery of thorax ..	162	Alkalinity of blood, measurement of ..	73
— tuberculous (<i>see</i> Tuberculous Abscess) ..	180	Alkalis and perchloride of mercury in black-water fever ..	66
Abscesses, localized, vacuoles in ..	22	Alkaloids, absorbed, action of ..	2
— of tonsil, Scott (Gillett) hayonet for ..	556	Allergy, abnormal drug reactions due to ..	19
— warm, new technique for treatment of ..	141	Alopecia ..	13
Acetone bodies in urine, tests for ..	196	— areata, quartz lamp in ..	118
Acetylacetic acid ..	1	— humeroscapular ..	13
— in chorea ..	116	Alpine sun lamps for chilblains ..	110
— — syphilitic iritis ..	200	— and dilatation of skin capillaries ..	116
Acetyls, bitters in ..	6	Alum and tale in excessive sweating of feet ..	141
gastric, hydrochloric acid in ..	1	Aluminium acetate in idiopathic hemorrhagic sarcoma of skin ..	115
Acid, acetylacetic ..	1	Amaurotic family idiocy ..	11
— (dyspepsia, colloidal bismuth in ..	10	Amberg's constant in renal surgery ..	277
Acidosis in diabetes mellitus, treatment of ..	150	Aniline wax dressings for burns ..	86
— skin diseases ..	110	Anenorrhoea, ovarian residue in ..	16
Acidum hydrochloricum in achylia gastrica ..	1	Anionia, preformed, in cerebrospinal fluid ..	106
salicylicum in rheumatism ..	2	Anionia-nitrogen in urine, tests for ..	196
— salicina ..	2	Ammuniated mercury obtundit in ringworm of scalp ..	100
Acidosis of Castellani, mixed iodides in ..	112	Amoebiasis ..	15
Acne vaccine 'B' (St. Mary's Hospital mixed) ..	510	Amoebic dysentery, benzyl benzoate in ..	15
Acne vulgaris ..	41	hepatitis and liver abscess ..	16
— quartz lamp in ..	118	Amoebicide, chenopodium oil as an ..	539
— vaccines in ..	22	Anæmia ..	48
— x-ray treatment of ..	36, 42	evidences of degeneration ..	48
• Acoustic tumours (<i>see</i> Cranial Surgery ; Ear, Tumor)		regeneration ..	48
Aerillaxine and mercurochrome-220 in chronic purulent otitis media ..	352	proteins in ..	19
Acrodermatitis chronica atrophicans ..	13	résumé of Pappenheim's conceptions re ..	4
Aeromically, x-ray treatment of ..	56	spleenic, mites concerned in ..	8
Actinomyces, radium in ..	35	Anæsthesia, apothesia spinal, death from ..	5
Actual cantury for carbuncle ..	91	in cerebral and spinal surgery ..	1
Acute abdomen, treatment of ..	10	chloroform ..	1
Aged, typhoid fever in the ..	183	ether ..	1
Air, entrance into a vent, danger of ..	509	ethyl chloride apparatus ..	1
Adeutitis, tuberculous, radium in ..	36	in face and neck operations ..	1
Adenoids and enlarged tonsils ..	170	intratracheal insufflation of chloroform ..	1
Adenoma of stomach ..	130	local ..	1
Adrenal gland ..	155	and mastoid operation ..	1
Adrenalin, dose causing death ..	2	in nose and throat work ..	1
in diagnosis of malaria ..	299	nitrous oxide ..	1
— glaucoma ..	215	and operation, therapeutic use of carbon dioxide after ..	1
injections in syncope of anaesthesia ..	53	post-operative treatment ..	1
for night sweats in pulmonary tuberculosis ..	478	rectal ether ..	1
— otosclerosis ..	352	spinal ..	1
pyelonephritis in children ..	113	in surgery of urinary tract ..	8
— vertigo ..	166, 511	syncope, epinephrin injection in ..	4
test in dementia praecox ..	112	resuscitation in ..	45
— of Loewi in disease of pancreas ..	351		
Adsorbed alkaloids, action of ..	2		
Advertisements, index to ..	607		

Anaesthesia in thoracic surgery	52	Argyrol for trachoma	52
— throat and nose operations	49	Arrhenal in bronchial spirochaetosis .. .	84
— thyroid operations	20	Arsenate of soda injection in buboes .. .	110
Anaesthetic, saligenin as an	53	Arsenic in psoriasis	372
tremor	18	— sarcoid tuberculosis of skin	113
Anæsthetics		Arsenical preparations in bronchial spiro- chaetosis	83
Mott's apparatus for dosimetric anæ- sthesia, by intratracheal insufflation ..	513	treatment of syphilitic pregnant women ..	157
Amphylactic phenomena in the patho- genesis of some forms of epilepsy	188	Arsenious oxide in carcinoma of external ear	162
symptoms from antipyrin	3	Arseno-argentum in syphilis	118
Anaphylaxis following prophylactic injection of diphtheria antitoxin	407	Arsenobenzol remedies in syphilis	118
Anastomosis, intestinal	269	— toxic effects of	515
ureteral	491	— in yaws	394
Aneurysm, aortic	54	Arsenobillon in relapsing fever	1
— subclavian, treated by distal ligation ..	509	Arsphenamin in equine influenza	1
— traumatic, of right pulmonary artery ..	509	— gangosa	1
Angina, Vincent's, arsenphenamin in .. .	4	— injections in chronic bronchitis	85
Angioma of stomach, sleeve resection of ..	429	— in leishmaniasis	1
Ankylostoma duodenale and pyloric obstruc- tion	55	— malaria	1
Ankylostomiasis	55	— non-syphilitic disease	1
— magnesium sulphate in	55	— pneumonia with delayed resolution in syphilitic soldiers	366
— oil of chenopodium in	55	— protozoal diseases	1
— capsules in	539	— pulmonary spirochaetosis	1
Anoxæmia, Barcroft's account of	396	— rat-bite fever	1
oxygen in	16	— relapsing fever	1
Antacids in gastric ulcer	209	— syphilitics	1
Antiflux-infected shaving-brushes from Japan ..	257	— trypanosomiasis	1
Antidarrhæic, magnesium silicate (tale) as ..	14	— Vincent's angina	1
Antidiphtheritic serum in ocular infections ..	198	— yaws	1
Antidysenteric serum in bacillary dysentery ..	156	Arterial tension, high	58
Antigonococcal serum in arthritis	229	— benzyl benzoate in	6
— — — — — hemorrhagic complications	201	— digitals in	60
Antimeningococcal serum, polyvalent, in ..	101	— and exercise	60
cerebrospinal fever	101	— technique of measurement	59
Antimony, action of on filaria bancrofti ..	203	Arteriosclerosis, general, relation to the eye ..	193
— oxide in trypanosomiasis	473	Arthritides and focal infection	535
— and potassium tartrate in granuloma ..	232	Arthritis and cerebrospinal fever	103
venereum	273	— colloidal sulphur in	10
— treatment of kulu-azar	273	— deformans, vaccines in	22
Antipyretic action of aspirin	1	— gonococcal, antagonococcal serum in ..	229
Antipyretics, action of	3	— intramine in	230
Antipyrin anaphylaxis	3	— sulfarsenol in	230
Antiseborrhæic ointment in seborrhæa	407	— intramuscular injections of milk in ..	20
Antiseptic value of ordinary and medicated soaps	20	— non-rheumatic, peptone injections in ..	19
Antisepsies, subarachnoid injection of .. .	1	— proteals in	19
Antisperm injection in eluoroid	110	— suppurative, paratyphoid-B bacillus and ..	359
Antitoxin, intramuscular injection of, in ..	153	Aspetoids for making solutions	539
diphtheria	510	Aspidosperma (quebracho)	5
in yeld sore	510	— in chronic pneumonia and bronchitis ..	5
Antityphoid vaccine in gonococcal complica- tions	229	— emphysema	5
Antum, malignant tumours of, treatment of ..	333	— symptomatic asthma	5
Anus, tuberculosis of	56	Aspirating syringe for buboes (Milk- Aspiration in anæmic hepatitis and liver abscess	513
— cautery treatment in	56	abscess	17
— Finsen light treatment in	56	— for tuberculous abscess	181
— x rays in	56	Aspirin, antipyretic action of	1
Aolan " intradermal injection in testing for cure in gonorrhæa	230	— in syphilitic tritis	200
Aortic Aneurysm	54	— tablets for nerve pains, migraine, etc. ..	512
Apothesis as a non-toxic local anæsthetic ..	54	Asthma, aspidosperma in	5
— spinal anaesthesia, death from	54	— of bacterial origin, bronchial, vaccines in ..	22
appendicitis, expectant treatment often advisable	40	— bronchial, autogenous vaccines in ..	60, 62
— following influenza	262	Asthma, bronchial, and hay fever	60
— and scarlet fever	402	— and hay fever, pollen extract in	61
appendicectomy in dysentery	16	— — — protein sensitization in	62
Appendix; surgery of	57	— peptone treatment in	61
x-ray examinations of	28	— tutin in	21
ch support for flat-feet, adjustable	514	Ashmatiform attacks, emetic in	62
gas persicus of tick fever	468	— tartar emetic in	62
centum (colloso) antiseptic	538	Atlas, fracture of (see Spinal Surgery) ..	125
gulan in syphilis	538	— symptoms and signs of	125
grol for burns of eyelid	88	Atonic ulcers, iodine in	13
— gonorrhæa in children	228	Atoxyl in trypanosomiasis	173
— — — women	226	Atrolin, an atropine derivative	572
		Atrophy, congenital, due to inherited syphilis	157
		Atropine in empyema	167
		— gastric action of	5
		— in sea-sickness	5

Atropine sulphate injections in gastric ulcer	232
"Atta" for beri-beri	136
Auditory hallucinations in mental diseases	321
-- mentus, earache due to larva in external	163
-- stenosis of external	163
Aural suppuration, acute, in early childhood	350
Auricular fibrillation and flutter, quinine in	242
Auriscopic, improved pattern	544
Autogenous vaccines in pyelonephritis in children	111
Autoserum therapy in encephalitis lethargica	182
Aviator's heart, x-ray examinations of	30
Axillæ and pubis, chronic papular itching eruption of	113
BACILLARY DYSENTERY	156
-- Bacillus tuberculosis, process of isolating from tissues	174
Bacteria and tissues, cleavage products from	8
Bacterial life-cycles	62
Bacteriological examination of urine	198
Bacteriology of blood	71
-- -- cerebro-spinal fever	102
-- -- diphtheria	151
-- -- influenza	260
-- -- measles	306
-- -- mumps	327
-- -- nephritis	334
-- -- paratyphoid fever	358
-- -- scarlet fever	101
-- -- trench fever	172
-- -- typhoid fever	182
Baghdad boil (see Delin Boll; Kala-azar)	
-- -- excision of	271
Balfour's use of rubber tube in colonic surgery	269
Barber's rash (see Sycois in Barber)	
Barley mite, dermatitis from	115
Bathos, otitis media in	350
Baths, hot, for gonorrhœa in women	225
-- -- in infantile vomiting	251
-- -- paraffin-bath	16
-- tepid "hall baths" in malaria	299
Bed-pan for males	511
Beef-bone screws in fractures and bone transplantation	522
Bell's palsy, hemi-hyposthesia in	105
Belladonna in gastric ulcer	211
-- -- infantile vomiting	251
-- -- spasmophilia	122
-- suppository in gastric ulcer	209
Bell, men's, for use after operations	515
Benzyl benzoate, action of	5
-- -- in amebic dysentery	15
-- -- arterial hypertension	6
-- -- biliary colic	6
-- -- bronchial spasm	6
-- -- dysmenorrhœa	6
-- -- enteric spasm	6
-- -- excruciating intestinal peritubercles	6
-- -- hiccup	6
-- -- intestinal colic	6
-- -- pyloric spasm	6
-- -- renal colic	6
-- -- spastic constipation	6
-- -- uterine colic	6
-- -- vesical spasm	6
-- -- whooping-cough	6
Beri-beri (see Deficiency Diseases)	513
-- "atta" for	136
-- as a deficiency disease	135
-- fruit juices for	136
-- "marute" for	136
-- metagen for	510
-- raw egg for	156
Beta-naphthol as antiseptic in intestinal toxæmia	202

	PAGE
Bicarbonate of soda dressings for burus	58
Bidet for female use	85
Bile, extract of beef gall in constipation	6
-- passages and gall-bladder, surgery of	201
-- surgery of (see Gall-bladder and Bile-passages)	201
-- pigments in blood chemistry	71
Bilharziasis	61
-- cocaine in	65
-- emetine in	65
-- tartar emetic in	65
Biliary colic, benzyl benzoate in	6
Bilocular or hour-glass stomach	112
Biological psychopathology	378
B.I.P.P. and vaccine in venet sore	510
Birth palsy, brachial, and injuries of similar type in adults	531
Bismuth in infantile vomiting	251
-- salicylate in bacillary dysentery	157
-- subcarbonate in gastric ulcer	210
Bitters in achylia	6
-- subacidity	6
Bierrum's sign in glaucoma	218, 219
Blackwater fever	65
-- alkalis and perchloride of mercury in	66
-- camphorated oil in	66
-- cardiac tonics in	65, 66
-- hyoscine with morphia in	66
-- morphia in	66
-- potassium bicarbonate in	66
-- rectal salines in	66
-- saline in	65
Bladder, colloid adenocarcinoma of	69
-- contracted, cystitis with	70
-- contracture of the neck of	67
Bladder, diseases of	66
-- cystoradiography in	66
-- malakoplakia of	69
-- secondary melan-epithelioma of	69
-- syphiloma of	67
-- tumours of	68
-- malignant, radium in	69
-- nitric acid injections in	69
-- trichloroacetic acid injections in	69
-- ulceration caused by dermoid cyst of vesicovaginal septum	70
Bleeding, functional, of uterus	500
Blennorrhagia complications, antizoonocoele vaccine in	201
Blepharospasm, colloidal sulphur in	10
Blood, bacteriology of	71
-- carbon-dioxide combining power	73
-- cells, mode of development	76
-- and nutrition	79
Blood-cell-forming organs, inter-relations of	78
Blood, chemistry of	71
-- alkalinity in	73
-- bile-pigments in	71
-- hydrogen-ion concentration in	73
-- cholesterol in	73
Blood, coagulation time of	72
-- creatinin in	71
Blood, cytology of	73
-- diastatic activity of	73
-- lipid constituents of	73
-- loss, continuous intravenous infusion in	12
-- mineral constituents of	73
-- non-protein and urea nitrogen of	73
Blood platelets	81
-- pressure, effect of tutin on	21
-- high, causes of	58
-- outfit	515
-- serum treatment in haemophilia	234
-- stream, renal pelvis as possible source of infection of	278
-- sugar in	72
-- transfusion (see Transfusion of Blood)	21
-- in circulatory collapse	21
-- urea, estimation of, in kidneys	275
-- uric acid in	72

	PAGE		PAGE
Boiled water for diarrhoea in breast-fed infants	255	Bronchiectasis (<i>see also</i> Thorax, Surgery of)	84
Boils (<i>see</i> Furunculosis)	255	— and abscess of lung	467
Bone cavities, obturation of, by muscle strips	536	— creosote in	81
— diseases, x-ray diagnosis in	30	— medical and surgical treatment in	81
Bone, exostoses of (<i>see</i> Exostoses)	522	Bronchitis, chronic	85
— grafting, beef-bone screws in	515	— — arsenaphenine injections in	85
— in treatment of fractures	515	— — aspirosperma in	85
Bone-grafts, autogenous, in certain simple fractures	521	— — uco-arsphenamine in	85
— — fundamental laws underlying use of	517	— — vaccines in	22
— infection, septic, with special attention to osteogenesis in sepsis	531	— oxygen in	16
Bone lesions, roentgenographic appearance, diagnosis, and pathology of some obscure cases of	526	Bronchoscopy and oesophagoscopy	85
Bones and joints, infections of	532	— Brossage's treatment for trachoma	121
— — miscellaneous affections of	532	— bulbo and gonorrhoea, milk injections in	250
— — long, causes of delayed union and non-union in fractures of	523	— Buboes after incision, mercurochrome-220 for	15
— and soft tissue, chronic infected wounds of, immediate sterilization and closure of	533	— — arsenate of soda injection in	110
— x-ray appearances of	30	— — electrargol injection in	110
Books of the year	558	— — Mills' aspirating syringe for	513
Boric acid dressings for burns	88	Buccopharyngeal cavity, cancer of, diathermy in	38
— — in thrush	408	Bullous eruption complicating measles	306
Borax with castile soap in scorrhoea	106	— — impetigo, autogenous streptococci vaccines in	118
Boric acid solution with liquor ammoni acetatis in eczema of lip	169	Burning or scalding pain in causalgia	96
— — fomentations, hot, in tinea sycoosis	445	Burns	86
— — ointment with camphor in eczema of lip	169	— — ambrine wax dressings for	86
— — starch poultices in sycoosis barbae	415	— — bicarbonate of soda dressings for	88
Botrytis infection	412	— — boric acid dressings for	88
Bottle in nickel case with concealed spring bougies, water-soluble, for gonorrhoea in women	516	— — digitalis in shock from	87
Brachial birth palsy and injuries of similar type in adults	297	— — electrical	88
Brain, abscess of (<i>see</i> Ear Disease, Intracranial Complications of)	531	— — of eyelid, argyrol or salt of for	88
— — otitic	159	— — morphia in shock from	86, 87
— — respiratory paralysis in	161	— — open-air method for	88
— — surgical treatment of	124	— — paraffin-wax for	87
— — retractors, Sargent's	545	— — saline and brandy injections in shock from	86
— — surgery of (<i>see</i> Cranial Surgery)	545	— — shock complications from	86
— — tumours of (<i>see</i> Cerebral Tumours)	101	— — tincture of iodine as antiseptic	87
— effects of radium on	82	— — x-ray	25
Breast, cancer of, operative procedure in	82	Burow's solution in ulcer of leg	188
— prophylactic post-operative treatment of	83	Buttermilk in chronic indigestion of children	113
— feeding of infants	249	Bynotone malt preparation	539
— — diarrhoea in	251		
— — female, fat necrosis of	82	C	
— — Papan's disease of	82	CATHETER for 'first aid' appliances	515
Breast, Surgery of (<i>see also</i> Cancer)	82	— — National Insurance cards	516
Breathing exercises in treatment of after-effects of pleurisy	365	Cachectic tuberculous children, horse serum in	20
Breathlessness, nerve path producing	397	Cacodylate of soda in idiopathic hemorrhagic sarcoma of skin	115
Bright's disease (<i>see</i> Nephritis)	539	— — — in sarcoid tuberculosis of the skin	113
Bromeron for irritable cough	189	Cade oil and sulphur in psoriasis of scalp	575
Bromide and luminal for epilepsy	251	Cæcostomy, valvular, in dysentery	46
— — sodium bicarbonate in infantile vomiting	422	Caffeine injection causing gas gangrene	7
Bromides in spasmodophilia	422	Calamine soothing lotion in sycoosis barbae	115
Bronchi, foreign bodies in, diagnosed by x-rays	20	Calmed magnesium and sodium bicarbonate in gastric ulcer	210
— — of bacterial origin, vaccines in	22	Calcium and bismuth carbonate in gastric ulcer	211
— — spasm, benzyl benzoate in	6	— — bromide in spasmodophilia	122
Bronchial spirochaetosis	83	— — chloride in bronchial spirochaetosis	83
— — archæal in	83	— — — for prevention of serious hemorrhages in suprapubic prostatectomy	371
— — arsenical preparations in	83	— — — and sodium iodide bath in catarrh	200
— — chloride of calcium in	83	— — lactate in nephritis	336
— — iodine in oil (Ipidiol) in	83	Calcui, prostatic	372
— — kharisan in	84	— renal and ureteric	280
— — norarsenobenzol in	84	— — ureteric	190
— — pyogenic infection in	81	— vesical	67
		Calimato-bacterium granulomatis organism in granuloma venereum	232
		Cullahan's law of the hearing centres	236
		Calomel injections in sarcoid tuberculosis of skin	113
		— — purge in glaucoma	216
		— — test for excretion of	15
		Cambridge's reaction and disease of pancreas	356
		Camphor and eucrine in glaucoma	217
		— injections, action of	7

	PAGE		PAGE
Camphorated oil in blackwater fever ..	66	Cautalgia, intracranial injection of 60 per cent alcohol in ..	97
--- typhus fever ..	188	nature of ..	97
Cancer (<i>see also under various organs, and Carcinoma</i>) ..	89	pathological nature of lesions in ..	97
--- of breast, operative procedure in ..	82	peri-arterial sympathectomy in ..	97
--- --- prophylactic post-operative treatment of ..	83	symptoms in ..	96
--- --- buccopharyngeal cavity, diathermy in ..	38	treatment of ..	97
--- --- cervix, radium in ..	31	Cautery, actual, in carcinoma of external ear ..	162
Cancer, clinical pathology of ..	90	--- treatment in tubercle of sinus ..	56
--- cuprum (colloidal) in ..	339	Cell-count of cerebrospinal fluid ..	106
--- factors causing delay in surgical treatment ..	89	Cell, Eye's sedimentation ..	551
--- --- of larynx ..	285	Cells pharyngeal and malaria ..	295
--- --- mouth, treatment by radium ..	33	Central nervous system diseases, urological findings in ..	198
--- operations, <i>x</i> rays as immunity-raising agents before and after ..	37	--- --- treatment ..	199, 500
--- of pancreas ..	357	--- --- external genitals in diseases of ..	199
--- --- pharynx ..	362	--- --- hæmaturia in diseases of ..	199
--- --- prostate in ..	19	--- --- internal sphincter and verumontanum in diseases of ..	199
--- --- radium treatment for ..	89, 118	--- --- pain in diseases of ..	199
Cancer of rectum ..	393	--- --- prostate and vesicles in diseases of ..	199
--- --- skin ..	111	rectal sphincter in diseases of ..	199
--- and solar keratoses ..	117	sexual powers in diseases of ..	199
--- of stomach, operability of, determined by <i>x</i> -rays ..	27	trabeculation in diseases of ..	199
--- --- tongue (<i>see Tongue, Cancer of</i>) ..	169	trigone changes in diseases of ..	199
--- --- uterus, radium in ..	31, 501	uræmia in diseases of ..	199
--- <i>x</i> -rays for ..	89	urinary symptoms in diseases of ..	198
Capillaries of the skin, methods of observation of ..	116	urine in diseases of ..	199
Caramel in diabetes mellitus ..	119	Cerebellar abscess ..	160
Chronic and tincture of iodine in chronic purulent otitis media ..	552	--- with complete homolateral hemiparesis ..	161
--- ointment in ringworm ..	104	involvement in measles ..	506
Carbon-dioxide combining-power and blood ..	73	Cerebellar symptomatology and localization ..	98
--- show in carcinoma of external ear ..	162	Cerebral abscess (<i>see Cranial Surgery; Ear Disease, Intracranial Complications of</i>) ..	
--- --- lupus vulgaris ..	291	Cerebral hæmorrhage in the new-born ..	99
--- --- trachoma ..	122	--- and spinal surgery, anaesthesia in surgery (<i>see Cranial Surgery</i>) ..	19
--- --- therapeutic use of, after anaesthesia and operation ..	51	Cerebral tumours ..	99
Carbuncle ..	91	--- localization by ventriculography ..	99
Carcinoma of duodenum ..	133	--- radium treatment for ..	101
--- --- external ear ..	162	--- Röntgen rays in treatment of ..	101
--- --- kidney, squamous-celled ..	282	Cerebrospinal fever ..	102
--- --- post-crioid region ..	362	--- and arthritis ..	103
--- --- squamous-celled, radium in ..	118	--- embrygia of sphenoidal sinus ..	101
--- --- treatment by radium ..	131	--- carriers of ..	102
Caroline form of influenza ..	261	--- and fatal relapse after ..	101
--- tonic, urine as a ..	21	--- glycosuria ..	105
--- tonics in blackwater fever ..	65, 66	--- intravenous therapy in ..	105
Cardiovascular syphilis ..	152	--- intraventricular infections in ..	105
Carrel-Dakin solution in mastoiditis ..	302	--- lumbar puncture in ..	101
'Carrier', typhoid, as a danger ..	259	--- and pyælis ..	101
Case bottle with concealed spring ..	516	--- serum treatment in ..	101
Castile soap with borax in scleroderm ..	406	--- symptoms of ..	103
Cataract (<i>see also Eye Affections, General</i>) ..	91	--- vaccine treatment in ..	105
--- bath of calcium chloride, sodium iodide, and distilled water ..	200	Cerebrospinal fluid ..	103
--- diouin in ..	92	cell-count of ..	105
--- extraction, suppurative after ..	96	colour test in ..	106
--- glass-blower's, and ultra-violet rays ..	91	Lange's colloidal gold test of ..	106
--- glycerin, boric acid, and water in ..	92	performed ammonia in ..	106
--- medical treatment of ..	91	pressure of ..	106
--- mercuric chloride in ..	93	protein content of ..	105
--- peptonate of mercury with sodium erythrolyte in ..	93	Wassermann reaction of ..	106
--- phakolytic serum and ..	92	Cervical and first dorsal ribs ..	107
--- physostigmine salicylate in ..	93	Cervicitis, potassium permanganate douches for ..	226
--- potassium iodide in ..	93, 94	Chagas' disease (<i>see Trypanosomiasis</i>) ..	173
--- radium action in ..	92	Chamomile, massage with camphorated oil of, in infantile vomiting ..	251
--- resorcin in ..	93	Chancroid ..	109
--- sodium thiocyanate in ..	93	--- antiseptic injection in ..	110
--- surgical treatment of ..	93	--- high-frequency spark with copper sulphate in ..	109
--- ultra-violet rays in ..	93	--- mercurochrome-220 in ..	15
Catgut, Lendon Hospital ..	516	phagelaic, action of pepsin on ..	17
Causalgia ..	96	potassium permanganate in ..	109
--- curious mental state in ..	96		

	PAGE		PAGE
Chancreoid, silver nitrate, balsam of Peru, and va-chine in	169	Chloro-athetoid and choreoepithetoid	171
- zinc chloride in	169	- dromes following encephalitis	171
Chemicozoa of derivatives in leprosy	286	Chronic bronchitis	85
Chemical examination of faeces	261	Chrysarobin with salicylic acid and ichthyol in psoriasis	372, 373
Chemistry of blood	71	Chrysophanic acid in diatheses	201
Chenopodium oil in ankylostomiasis	7, 55	Chubrial tissue, action of pepsin on	17
- - - for ascaris and other worms	7	Circulatory defects, local, paraffin-wax baths in	16
- - - capsules for ankylostomiasis and round worms	539	Claudication, intermittent, paraffin-wax baths in	16
- - - in uncinariasis	7	Clavicle, sarcoma of	117
Chest, surgery of (see Thorax, Surgery of)		Cleavage products from bacteria and tissues	118
Chilblains , Alpine sun lamps disappoint- ing	110	Cleft palate and hare-lip	16
- - diathermy useful for	110	Clotting, ovarian residue in	71
- - vaccines in	22	Coagulation time of blood	373
Childbirth and pregnancy, influenza in	263	Coal tar in psoriasis	373
Childhood, acute aural suppuration in early	356	Cocaine, carbolic, and glycerin drops in otitis media	350
- - chronic indigestion in	112	- - injection to obtain a tranquil tracheotomy in rhinogenous brachy	171
Children, dental sepsis in (see Dental Sepsis)	143	Coccidynia , etiology, symptoms, and treatment of	118, 119
Children, fever in	111	Codera in bullous zoster	65
- - fulminant otogenous osteomyelitis of temporal bone in	351	Codeme in pneumonia type I	366
Children, gastro-intestinal dis- orders in	111	Coal-tar oil for fardine drops	138
- - gonorrhoea in	227	- - - - - flickeys	135
- - mixed tumours of kidney in	282	- - - - - in spasmodic	122
- - nasal accessory sinuses of	332	Com-catchers, dangers of using, for foreign bodies in the air and food-passages	86
- - purpuric nephritis in	114	Colectomy in mobile colon	120
- - pyelonephritis in, autogenous vaccines in	114	Colitis, acute, in children	112
- - - - - epinephrin in	113	Colic, biliary, intestinal, renal, ureteral, and uterine, benzyl benzoate in	6
- - - - - hexamine in	114	Colitis in children (see Children, Gastro-intestinal Disorders in; Infant Feeding)	
- - skin capillaries in	417	- - ulcerative tuberculous, x-ray diagnosis of	28
- - staphylococcal infections of, autogenous vaccine in	417	Collapse, circulatory, transfusion of blood in	21
- - suppuration in urinary passages in	113	Collargol for gonorrhoea in women	226, 227
- - syphilitic newborn, gaily injections in	457	'Collectionism' in mental diseases	322
- - typhus fever in	486	Colles's fracture, Todd's splint for	552
- - urinary disorders in	113	Colloid adenocarcinoma of bladder	69
- - young, subcutaneous use of milk in	19	Colloidal bismuth in acid dyspepsia	10
Child welfare (see Maternity and Child Welfare)	304	- - drugs as germicides	9
Chilomyxozou-strongyloplasmata, three types of	63	- - gold test of cerebrospinal fluid	106
Chloral hydrate in chorea	116	- - iodine	510
- - per rectum in spasmodic	122	- - metals, action on various toxins	9
Chloride of calcium in bronchial spirochaetosis	83	- - as oxygen carriers	539
Chlorides in urine, tests for	497	- - palladium (pallamine) in gonorrhoea	228, 511
Chlorodyne in liquid paraffin for aeroph- thalmia	122	- - sulphur in arthritis	10
Chloroform anaesthesia, protective action of sodium bicarbonate given intra- venously during	51	- - - - - blepharospasm	10
- - inhalation in spasmodic	422	- - - - - and mercury in gonorrhoeal arthritis	10
- - intratracheal insufflation of	53	- - - - - in muscle and joint pains	10
- - in myiasis	320	- - - - - neuritis	10
Chloroma and malignant tumour, mastoid disease simulated by	304	- - - - - photophobia	10
Cholecystenterostomy, operation of	205	- - - - - rheumatism	10
Cholecystitis, paratyphoid	358	- - - - - scrophulosis	10
- - in typhoid fever	183	Collosol sulphur	512
Cholera	114	Colon bacillus pyrexia, vaccines in	22
- - gum solutions in	115	Colon, mobile	119
- - hypertonic salines and alkalis in	115	- - - - - colectomy in	120
- - permanganates in	115	- - - - - colopexy in	119
- - prophylactic inoculation in	111	- - - - - plication method of treatment	120
Cholesterin in blood	73	Colonic surgery, Balfour's use of rubber tube in	269
Choleval for gonorrhoea in women	225	Colopexy in mobile colon	119
Chorea	115	Colostomy , a new method of	120
- - convalescence in	116	Colour test in cerebrospinal fluid	106
- - diet in	116	Complement-fixation test for gonorrhoea	230, 231
- - drugs in	116	Compress, hot, in infantile vomiting	231
- - horse serum in	116	Concussion syndrome in prognosis of head injuries	126
- - massage, importance of	116	Congenital atrophy due to inherited syphilis	157
- - rest in bed, importance of	115	- - ectodermal defect	112
- - tapeworm origin	115	- - foot deformities	509

	PAGE
Congenital hypertrophic pyloric stenosis (<i>see</i> Stomach, Surgery of)	155
--- narrowness of pyloric orifice, x-ray examination of	26
Congenital syphilis (<i>see</i> Syphilis, Inherited)	156
Conjunctiva, diseases of	121
Conjunctiva, chronic, konopno bisentis m.	519
--- extract of beef gall in	6
--- spastic, benzyl benzoate in	6
Contracture of the neck of the bladder	67
Convalescents' serum in scarlet fever	103
Copper sulphate, high-frequency spark with, in chancroid	109
--- solution in scabies	400
Copper dermatitis	144
Cord depressor for hernia	516
'Corn syrup' or glucose feeding in marasmus infants	252
Cornea, infected ulcers of, perchloride of mercury injections for	199
--- macular keratitis	196
Corneal lupus, iodine in	13
Cough, irritable, bromocoin for	539
Cow's milk injections in ocular affections	198
Cranial surgery	125
Cresate in bronchiectasis	84
Crimin in blood	72
Cretorhiza in disease of pancreas	355
Crime and shell-shock	387
Criminality and mental deficiency	314
Cupric sulphate in furunculosis	244
Cuprum (colloidal) in cancer	539
Curetage in disorders of uterus, dangers and uses of	502
--- lopus vulgaris	291
Cutaneous filariasis	414
--- leishmaniasis (<i>see also</i> Delhi Boil, 139)	274
Cyanosis, oxygen in	16
--- true and false	396
Cysticercus of the vitreous	197
Cystitis with contracted bladder	70
--- cystica	278
--- mercurochrome-220 in	15
--- methamine with acid phosphate of soda in	540
--- varicines in	22
Cystodermography in bladder diseases	46
Cysts, congenital multilocular, of the retina	397
--- of pancreas	356
--- paraneoplastic	283
Cytological examination of urine	197
Cytology of blood	75

DACRYOCYSTITIS	195
Dakin's oil for chronic dacryocystitis of children	228
Dangers of x-ray work	25
Deaf, education of the	130
--- outlook for the	130
Deafness, acquired, and congenital deafness	129
--- artificial aids to hearing in	131
--- the Ayrshire family and	127
Deafness and Deaf-mutism (<i>see also</i> Ear, Inner; Hearing, Mechanism of; Otosclerosis)	127
--- economic aspect of	131
--- hysterical	165
--- of old age	164
--- reflex signs useful in examining for	129
--- sporadic congenital	127
--- and tinnitus, diathermy and eulium in	166
Death from overdose of adrenalin	2
Deapsulation of kidneys in nephritis	336
Deficiency diseases	131
--- beri-beri	135
--- famine dropsy	137
--- melanogen in	340
--- pellagra	136

Deficiency diseases, rickets	131
--- --- scurvy	135
--- --- vitamin diet in	512
Deformities, growth, cause of	329
--- and their treatment	326
Dehydration of tissues after vomiting or diarrhoea, continuous intravenous infusion indicated	12
Delhi boil (<i>see also</i> Kala-azar)	139
--- emetine injections for	139
--- --- tartar emetic injection for	133
--- --- x-rays for	139
Dementia	323
Dementia præcox	159
--- adrenalin test in	142
--- etiology and pathology	159
--- re-education in	142
Dengue , sodium salicylate and bicarbonate for	143
Dental sepsis in children	113
Dermatitis	111
--- from barley mite	115
--- copra	144
--- exfoliative, and polyneuritis, following neosalvarsan	150
--- due to hat linings	145
--- nasal, silver nitrate lotion in	144
--- ragweed, pollen vaccine in	144
--- --- resorcin lotions for	145
Dermatoses, precancerous	408
Dermoid cyst of vesicovaginal septum causing bladder ulceration	70
Dhobie itch (<i>see</i> Fungi, the Higher, in Human Diseases)	203
--- --- chrysophanic acid in	204
--- --- sulleylic-sulphur ointment in	204
Diabetes, skin eruptions in	408
--- xanthoma as indication of	409
Diabetes insipidus , lumbar puncture in	145
--- --- pituitary extract in	145
Diabetes mellitus	145
--- alcohol in	148
--- --- curamel in	149
--- --- combined with nephritis	150
--- --- decoction of eucalyptus in	149
--- --- diet restriction in	148
--- --- and endocrine gland disease	146
--- --- fatty food restriction in	148
--- --- low-fat, starch-free diet table	149
--- --- Moebius's antidiabetic serum in	149
--- --- opotherapy in	149
--- --- pancreon in	148
--- --- pituitary extract in	149
--- --- and pulmonary tuberculosis	150
--- --- rabbit serum in	148
--- --- sugar-free vegetables in	150
--- --- vegetable diet in	148
Diabetic epilepsy	189
Diagnosis, x-ray	25
Diaphragmatic hernia, diagnosis by x-rays	27
Diarrhoea (<i>see</i> Infantile Diarrhoea and Colic)	253
--- in breast-fed infants	254
Diarsenal and mercury in aortic aneurysm	5
Diastase test of kidneys	27
Diastolic activity of blood	7
Diathermy in cancer of the buccopharyngeal cavity	38
--- for chilblains	110
--- --- gonorrhoea in women	223
Dichlorazine paste in mastoiditis	330
Dictionary of remedies	1
--- of treatment	1
Diet in gastric ulcer	200, 21
--- --- glaucoma	21
--- restriction in diabetes mellitus	1
--- table in diabetes mellitus	1
Dietetics, progress of	5
Digestive tract, x-ray examination of	4

	PAGE		PAGE
Digitalis in empyema	167	E A. R. acute inflammation of middle	
- heart disease	240	- otalgia in	541
- high arterial tension	60	- cone, Mart's	516
- influenza	261	Ear disease, intracranial compli-	
- and pituitrin in shock from burns	87	- cations of (see also Cranial	
- whiskey in pneumonia type I ..	366	Surgery)	157
Dilatation of pelvis and ureter, causes of	277	- - syphilitic affection of sixth and eighth	
- vesical end of ureter	192	nerves in	161
Dilating sounds, Watson's urethral ..	551	- - tumours of eighth nerve in	166, 167
Dilator, Kollmann's flushing, improved		- - in typhoid fever	161
form	547	- - diseases and lumbar puncture	166
- urethral, stand and clamp for ..	553	Ear, external, affections of	162
Dinutry's operation in excision of		- - carcinoma of	162
sciera	194	Ear, inner, affections of	163
Dionin in cataract	92	- - metastatic carcinoma of	168
Dioxide snow for hæmangioma ..	233	Ear, middle, disease of (see Otitis	
Diphtheria bacillus vaccine (St. Mary's		Media)	
Hospital) in treatment of 'carriers'	539	Barache due to larvae in external auditory	
Diphtheria , bacteriology of	151	meatus	163
- carriers, tonsillectomies on	151	Eclampsia (see Pregnancy, Disorders of)	368
- treatment of	151	- magnesium sulphate in	368
- co-inophthosis myocarditis in ..	151	- morphia in	368
- intramuscular injection of antitoxin in	153	- venesection in	368
- morbid anatomy of	151	Ectodermal defect, congenital	112
- prophylaxis in	153	Eczema (see also Skin, General Therapeu-	
- rapid bacteriological diagnosis in	151	- tics of)	168
- symptoms of	152	- eucodylate and hypsulphite of soda in ..	117
- toxin-antitoxin in	153	- causes of	168, 169
- treatment in	153	- - chronic, and intestinal dyspepsia, vaccine	
- of the umbilicus	152	therapy in	118
- vaccine and antitoxin treatment in	151	- ointments for	169
- of the vagina and skin of natal cleft	152	- post-scabietic, skin capillaries in ..	116
in wounds	152	- quartz lamp in	118
Disinfectant, fecto as	539	- of vermillion border of lip	169
Dissolution of shoulder-joint ..	535	- vesiculosum, paraffin-wax baths in ..	16
Dispargen for gonorrhoea in women	226	Editor's table: progress of pharmacy,	
Disseminated sclerosis (see Sclerosis,		dietetics, and new medical and	
Multiple)	405	surgical appliances	538
Dmretic, tutin as a	21	Education of the deaf	130
- waters for urteric stones	190	Egg, raw, for herb-beri	136
Diverticula of urethra	193	- shampoo in seborrhoea	107
Diverticulitis (see Intestines, Surgery		Electroargol for gonorrhoea in women	226
of)	268	- injection in buboes	110
Dream interpretations in psychoneuroses	382	Electric heater, the 'Zeva' immersion	518
Dropsy, Lamine, as a deficiency disease	137	- torch for ear, throat, and nose examina-	
Drug reactions, abnormal, due to allergy	10	tion	517
- treatment, pepsin solution in ..	17	Electrical burn	88
Duct sign in mumps	328	Electricity and the ductless glands ..	39
Ductless glands, clinical pathology of	155	- in nerve and muscle injuries	38
- electricity and its action on	39	Electrocardiography in diagnosis of heart	
- and skin eruptions	408	disease	237
Duodenal ulcer (see Gastric and Duo-		Electrocautery in lupus vulgaris	292
denal Ulcer; Stomach, Surgery of)	412, 443	Electrolysis for hæmangioma	253
- - and gastric ulcer	249	- in the treatment of naevi in children	38
- - X-ray examination of	25	Electrotherapeutics	37
Duodenini, carcinoma of	433	- in lupus vulgaris	291
Dysentery, amebic (see Amebiasis) ..	15	Elliot's sign of glaucoma	218
- benzyl benzoate in	15	- trephine operation for glaucoma ..	211
- appendicectomy in	16	Embolism, multiple, a sign of endocardial	
Dysentery, bacillary (see also Ame-		disease	183
- biasis)	156	Embolism, pulmonary	170
- antidyseritic serum in	156	Emetine in amebic hepatitis and liver abscess	17
- autogenous vaccines in	157	- - asthmaticform attacks	62
- bismuth salicylate in	157	- - bilharziasis	65
- - camphorated tincture of opium in	157	- - dysentery	16
- ememas in	157	- - injections for Delhi boil	159
- etiology and treatment of	156	Empysema, aspirosperma in	5
- normal saline in	157	- subcutaneous, rare in influenza ..	262
- emetine in	16	Empyema (see Thorax, Surgery of)	
- enterostomy in	46	- atropine in	167
- ileo-tomy in	46	- chronic	161
- surgical treatment in	46	- classification of cases in young adults	166
- valvular caecostomy in	46	- digitalis in	167
Gonorrhoea, benzyl benzoate in	6	- heroin in	167
- ovarian residue in	16	- iron in	167
- X-ray treatment of	31	- morphine in	167
Gapesia, acid, colloidal bismuth in	10	- oxygen in	167
- post-influenzal	261	- of sphenoidal sinus and cerebro-pinal	
- pneumonia, method of measuring ..	396	fever	104
		- in surgery of thorax	163, 164

	PAGE		PAGE
Empyema, immediate closure of ..	161	Epithelioma, benign cystic, with xeroderma pigmentosum ..	191
Encephalitis lethargica (<i>see also</i> Infections Diseases Prevention) ..	171	Epstein's high-protein diet in chronic parenchymatous nephritis ..	536
- acute delirious form of ..	177	Equine influenza, asphenanthin in ..	1
- antiserum therapy in ..	182	Eruptions of skin as index to general disease ..	107
- bacteriology of ..	180	Erysipelas, vaccine therapy in ..	118
- cases simulating surgical abdominal lesions ..	180	Erythema dosage of radium in malignancy ..	35
- catatonic stunner in ..	177	- of x-rays in favus ..	202
- choreic and athetoid movements following ..	171, 175	- multiforme eruptions of skin ..	108
- chronic relapsing type of ..	178	- lesions of mucosae in ..	111
- clinical types and symptoms of ..	173	Erythema nodosum and tuberculosis ..	191
- confusional form of ..	177	Erythromelalgia, skin capillaries in ..	117
- duration of ..	173	Eserine in glaucoma ..	216, 217
- in girls' home ..	255	E-tape's method in gangrenous strangulated hernia ..	217
- hexamine in ..	181	Ether anaesthesia ..	50
- historical aspects of ..	171	- effect of, on tubercle ..	50
- hyperkinetic-psyche type of ..	173	- injections in whooping-cough ..	511
- Korsakow's syndrome type of ..	177	- mask, the 'Petron' ..	517
- mild abortive types of ..	171, 179	Ethereal soap in ringworm of scalp ..	100
- myoclonic type of ..	175, 176	Ethyl chloride, apparatus for prolonged administration of ..	52
- ocular manifestations of ..	178	- freezing for skin-grafting ..	419
- paralysis agitans syndrome following ..	171, 175	- in ringworm of scalp ..	400
- prognosis of ..	181	Eucalyptus decedon in diabetes mellitus ..	119
- psychic types of ..	177	- oil in olive oil for gonorrhoea in women ..	225
- psycho-somnulent type of ..	177	Eusol injection in malaria ..	299
- sporadic case of ..	175	Eustachian inefficiency, unilateral, vertigo and ..	511
- symptoms of ..	172, 173	Excision in carcinoma of external ear ..	162
- tabetic type of ..	171	- lupus vulgaris ..	290
- treatment of ..	181	Exercise and arterial tension ..	60
- turpentine injection to produce local abscess in ..	181	Exercises, physical, for irritable heart ..	211
Endocarditis, blood cultivation in ..	183	Exophthalmic goitre, radium and x-rays in ..	37
- fever in ..	183	Exostoses, benign ..	191
- multiple embolism in ..	183	- multiple, x-ray diagnosis in ..	31
- physical signs of ..	183	Expectorant action of primula officinalis ..	17
Endocarditis, subacute bacterial ..	182	Eye affections, biological methods of treatment ..	201
Endocrine glands, diabetes mellitus and diseases of ..	116	- serum therapy in influenza and ..	201
Endomyces ulcarius infection ..	112	- changes in pregnancy ..	193
Enemas in bacillary dysentery ..	157	- concussion injuries to the ..	198
- hot, in infantile vomiting ..	251	Eye diseases, focal infection in relation to ..	191
Entamoeba histolytica, honey-dy as carrier of ..	15	Eye, enucleation of, and its substitute operations ..	193, 194
Enteritis, acute infectious, with a polyneuritic syndrome ..	181	Eye, general affections of (<i>see also</i> Cataract; Conjunctiva; Glaucoma; Retina) ..	195
Enterospasm, benzyl benzoate in ..	6	Eye, general therapeutics of ..	198
Enterostomy in dysentery ..	16	- inflammatory diseases of, Rohmer's antiserum treatment for ..	198
Enucleation of eye, and its substitute operations ..	193, 194	- injuries ..	198
Eosinophilous myocarditis in diphtheria ..	151	- from high-voltage currents ..	198
Epidemic encephalitis (<i>see</i> Encephalitis lethargica) ..	171	- relation of general arterio-sclerosis to the ..	193
- influenza complicated by acute osteomyelitis and periorbitis ..	533	- sign in mastoiditis ..	501
Epidermophyton fungus in 'Hong Kong foot' ..	115	- tapeworm larvae occurring in ..	197
- infections, ointment in ..	115	- tuberculous diseases of, kryosolgan for ..	199
Epididymitis, acute and gonorrhoeal ..	169	Eyelid, burn of, argyrol and silvol for ..	88
- gonococcal, sulfarsenol in ..	239		
- and orchitis following paratyphoid fever ..	359		
Epididymitis in syphilis barbae ..	115		
Epilepsy ..	185		
- anaphylactic phenomena in the pathogenesis of some forms of ..	188		
- bromide and luminal for ..	189	FACE operations, anaesthesia in ..	48
- diabetic ..	189	- Facial neurægia, diagnosis of varieties of ..	513
- essential, as a life-reaction disorder ..	186	- palsy and acoustic symptoms, herpes zoster oticus with ..	213
- and heredity ..	189	Fæces, amount of stercobilin in ..	202
- luminal for ..	189, 190	Fæces, examination of ..	201
- nature and meaning of the convulsion ..	187	- occult blood in ..	202
- a new conception of ..	185	- soluble albumin in ..	202
- psychological causes of loss of consciousness in ..	188	- spoon for collection of ..	553
Epileptic character, detailed development of ..	187	Famine dropsy, cod-liver oil for ..	138
Epinephrin (<i>see</i> Adrenalin) ..	187	- as a deficiency disease ..	137
Epithelioma, basal-celled, radium in ..	118	Pat necrosis of female breast ..	82
		Favus, erythema dose of x-rays in ..	202
		Fecto-disinfectant ..	539

	PAGE		PAGE
Feeding of infants (<i>see</i> Infant Feeding) ..	249	Fracture, and bone transplantation, heel-	
Feet, excessive sweating of (<i>see</i> Sweating of Feet, Excessive)		bone screws in ..	522
--- alum and tale in ..	441	bone-grafting in treatment of ..	515
--- weak or flat, new combination foot sup-		compound, of femur ..	525
port for ..	528	non-union in ..	523
Femoral hernia ..	245	of femoral neck, treatment of fresh and	
neck fractures, treatment of ..	521	united ..	521
Femur, Albee's method of treatment of		femur from orthopaedic point of view ..	526
pseudarthrosis of neck of femur ..	530	hip, ununited ..	521
central luxation of ..	525	jaw ..	522
compound fracture of ..	525	long bones, causes of delayed union	
fractures of, from the orthopaedic point of		and non-union in ..	523
view ..	526	open treatment of ..	521
Ferri Iodidi, elixir, improved form of ..	539	of radius and ulna ..	522
Fever in children ..	111	Schoenmann clamp in ..	526
cerebrospinal ..	102	simple, autogenous bone-grafts in ..	521
paratyphoid ..	558	plating of ..	522
relapsing ..	395	of tibia and fibula: treatment by plating	
scarlet ..	101	operations ..	522
tick ..	168	treatment of central luxation of femur ..	525
trench ..	172	Freer's radium applicator for use in cancer of	
typhoid ..	182	larynx ..	286
typhus ..	486	Fruit-juices for beet-beri ..	136
yellow ..	515	Fungi, the higher, in human	
Fibrillating ventricles, massage of ..	53	diseases ..	203
Fibrolysin in malignant pterygium ..	122	Furunculosis (<i>see also</i> Skin, General	
Fibro-myo-angio-epithelioma of middle ear,		Therapeutics of) ..	201
and mastoid disease ..	301	caodylate and hyposulphite of soda in ..	417
Fibrositis of smaller joints, paraffin-wax		colloidal manganese in ..	510
baths in ..	16	hydrochloric acid and charcoal in ..	201
vacuines in ..	22	vaccine therapy in ..	22, 201, 418
Fibula and tibia, fractures of: treatment by		zinc carbonate and cupric sulphate in ..	201
plating operations ..	522		
Filaria bancrofti, action of antimony on ..	203	GALL-BLADDER and bile pas-	
medinensis or guinea-worm, tartar		sages, surgery of ..	201
emetio in ..	203	Gall-stones, clinical pathology of	
Filariasis ..	202	x-ray diagnosis in ..	28
cutaneous ..	414	Galyi injections in syphilitic new-born chil-	
sodium antimonyl tartrate in ..	203	dren ..	457
Flinsen-light treatment in tubercle of anus ..	56	Gangosa, arsenphenamin in ..	1
'First aid' cabinet ..	545	Gas embolism of lateral sinus after mastoid	
Fixation abscess by turpentine infection in		operation ..	158
influenza ..	264	gangrene after injection of caffeine ..	7
Flail joints, treatment of ..	535	Gasserian ganglion, cutting sensory root of,	
Flut-loom, adjustable arch support for ..	544	for relief of trifacial neuralgia ..	316
and other static foot troubles ..	528	Gastric action of atropine ..	5
Mavine in hypopyon keratitis ..	199	Gastric analysis ..	206
ophthalmia neonatorum ..	199	significance of ..	207
ophthalmic surgery ..	199	technique and apparatus for ..	206
Plexion of knee ..	535	test-meals in ..	206, 207
Miles as carriers of Entamoeba histolytica ..	45	contents, chemical analysis of ..	208, 209
Mocal infection, the arthritides and ..	535	Gastric and duodenal ulcer (<i>see also</i>	
in relation to eye diseases ..	191	Stomach, Surgery of) ..	209
Food deficiency diseases (<i>see</i> Deficiency Diseases) ..	151	antacids in ..	209
Food poisoning (<i>see</i> Infections Diseases		atropine sulphate injections in ..	212
Prevention)		belladonna suppository in ..	209
outbreak (paratyphoid B) ..	256	bismuth subcarbonate in ..	210
Foot, anterior arch trouble of ..	528	calcined magnesia and sodium	
contracted ..	528	bicarbonate in ..	210
deformities, congenital ..	529	calcium and bismuth carbonate	
flat ..	511	in ..	211
troubles ..	528	diet and rest in ..	209, 211
weakened: its measurement and correc-		gastro-enterostomy in ..	215
tion ..	529	nutritive enemata in ..	209
Forceps, Corbould's tongue ..	548	olive oil in ..	211
Hendlin's lung ..	547	scapsuls enemata in ..	209
Pannett's peritoneum ..	548	sodium bromide in enemata in ..	210
Sallisbury's packing or tissue-holding ..	548	tinct. belladonna in ..	211
suture-carrying, Guthrie's ..	550	lavage in infantile vomiting ..	251
Foreign bodies in air- and food-passages,		Gastric surgery (<i>see</i> Stomach, Surgery	
danger of coin-catchers ..	86	of)	
bronchii, x rays for ..	29	Gastric tumours (<i>see</i> Stomach, Surgery	
heart and vessels, x rays for ..	30	of)	
rectum ..	394	ulcer, chronic ..	440, 441
Powder position, Cuthbert's prop for main-		Gastritis, phlegmonous ..	134
taining patients in ..	550	Gastro-enterostomy for gastric and duodenal	
Fracture of atlas (<i>see</i> Spinal Surgery)		ulcer ..	213
symptoms and signs of ..	123		

	PAGE		PAGE
Gastro-intestinal disorders in children (see Children, Gastro-intestinal Disorders in) ..	111	Gonorrhea in males, tripartite for ..	225
- - - tract, x-ray diagnosis ..	25	- - - vaccines for ..	228, 229
- - - gastrojejunal and jejunal intubation ..	138, 139, 140	- - - mercurochrome-220 in ..	15
- - - gastrojejunostomy ..	137, 138	- - - palladium (colloidal palladium) in ..	511
- - - healing of chronic ulcers after ..	129	- - - testing for cure with "aolan" ..	230
General paralysis (see Mental Troubles of Syphilis; Syphilis of the Central Nervous System)		- - - tests of cure ..	221, 225
(fasiculate ganglion, neuralgias accredited to the ..	311	- - - vaccine (St. Mary's Hospital mixed) ..	511
Geniculate ganglion syndrome (herpes zoster oticus, with facial palsy and acoustic symptoms) ..	213	- - - in women, urolyol for ..	226
- - - neuralgia, Hunt's ..	211	- - - - - choleval for ..	225
(genitals, external, in diseases of central nervous system ..	499	- - - - - collateral for ..	226, 227
Genito-urinary complications of influenza ..	262	- - - - - diathermy for ..	225
- - - troubles, metramine with acid phosphate of soda in ..	540	- - - - - dispargen for ..	226
(gentian violet for wounds ..	17	- - - - - electrazol for ..	226
(mercuride, potassium mercuric iodide as a ..	9	- - - - - eucalyptus oil in olive oil for ..	225
(germicide, colloidal drugs as ..	412	- - - - - glycerin for ..	225
Gland secretion, saccharous, deficiency of ..	412	- - - - - "gonargin" for ..	227
(glass-blower's cataract and ultra-violet rays ..	24	- - - - - hot baths for ..	225
Glaucoma ..	216	- - - - - Jago's solution for ..	227
- - - calomel purge in ..	216	- - - - - methylene blue for ..	226
- - - camphor and eserin in ..	218	- - - - - picric acid in glycerin for ..	225
- - - diagnosis from tritis ..	217	- - - - - protargol for ..	225, 226
- - - dionin and eserin in ..	216, 217	- - - - - sucrose pessaries for ..	225
- - - Elliot's sign of ..	218	- - - - - tinctura hyoscyami, sodii bromidum, and liq. potassii citratis in ..	226
- - - trephine operation for ..	214	- - - - - tincture of iodine for ..	226
- - - light diet in ..	216	- - - - - vaccines for ..	225
- - - morphia in ..	216	- - - - - water-soluble bougies for ..	227
- - - pilocarpine and adrenalin in ..	215, 216	(gonorrheal arthritis, colloidal sulphur and mercury in ..	10
- - - Roenne's step and Bierum's sign in ..	218, 219	- - - intramuscular injections of milk in ..	20
- - - Sedgell's sign in ..	218, 219	- - - complications, vaccines in ..	230
(glioma retinae, radium in ..	35	- - - epididymitis ..	160
(glossitis, Moeller's ..	411	- - - iritis ..	196
(glucose or "corn syrup" feeding in marasmus ..	252	- - - rheumatism, vaccines in ..	22
- - - infants ..	252	- - - urethritis, silver nitrate or silver amelanate for ..	226
- - - solutions, hypertonic, in influenza pneumonia ..	11, 265	- - - vaccines in keratoderma bleunorrhoea Gouty joints, paraffin-bath baths in ..	418
- - - in urine, tests for ..	496	Granuloma venereum ..	251
(glycerin, boric acid, and water in catarrh ..	92	- - - calumato-bacterium granulomatis or - - - causus in ..	232
- - - for gonorrhoea in women ..	225	- - - Röntgen rays in ..	232
(glycosuria and cerebrospinal fever ..	104	- - - tartar emetic injections for ..	232
- - - renal ..	116	- - - x rays in ..	232
(goitre, exophthalmic, radium and x rays in ..	37	Grey powder as antiseptic in intestinal toxemia ..	206
- - - operations, anaesthesia in ..	49	- - - orally, with mercury injections, in syphilitic newborn children ..	457
Goitre, surgical aspects of ..	220	Growth deformities, cause of ..	529
- - - tomipoint operation in ..	221	(Guinea-worm (filaria medinensis) infection, tartar emetic in ..	203
- - - toxic ..	221	(gun solutions in cholera ..	115
- - - x rays in ..	221	(gunshot wounds of head, physiological pathology of ..	123
Gold and platinum wire in aortic aneurysm ("gonargin" for gonorrhoea in women ..	51	- - - nasal accessory sinuses ..	331
(gonocoeval arthritis and epididymitis, sulfarsenol in ..	230	- - - spinal cord ..	122
- - - intramural in ..	230	(gynaecology, radium in ..	51
- - - serum therapy in ..	229	- - - vaccines in ..	22
- - - complications, antityphoid vaccine in ..	221	HÆMANGIOMATA , carbon-dioxide snow for ..	233
Gonorrhea (colloidal) in ..	538	- - - electrolysis for ..	233
- - - and bubo, milk injections in ..	230	Hæmangiomas and lymphangiomas ..	233
- - - in children ..	227	Hæmatogenous infection of the kidney ..	278
- - - - - argyrol for ..	228	Hæmatoma of ovary complicating mumps ..	328
- - - - - Jago's solution for ..	228	Hæmatoma in diseases of central nervous system ..	199
- - - chronic, vaccines in ..	22	Hæmophilia , blood-serum treatment in ..	231
- - - colloidal palladium (pallamine) for ..	510	Hæmorrhage control after removal of tonsils ..	470
- - - intramural in ..	228	- - - cerebral, in the newborn ..	99
- - - potassium permanganate for ..	228	- - - after mastoidectomy in purpuric patient ..	303
- - - prostatic massage for ..	228	- - - rabbit serum in ..	20
- - - silver nitrate irrigation for ..	228	- - - in suprapubic prostatectomy, calcium chloride to prevent ..	371
- - - tramine for ..	228	Hæmorrhagic jaundice ..	270
		- - - measles ..	306
		- - - scarlet fever, malignant ..	101, 11
		Hæmorrhoids, internal ..	235, 235

	PAGE
'Hailouname' (destructive impulse) in mental diseases ..	322
Hairy scalp, transplantation of, in alopecia ..	43
Hallucinations in mental diseases ..	320
Hallux valgus and ridulus ..	328
Hand, noma of ..	348
Hare-lip and cleft palate ..	118
Hay fever (<i>see also</i> Asthma) ..	60
— and asthma, pollen extract in ..	61
— — — protein sensitization in ..	62
Hay fever and bronchial asthma ..	60
Head, gunshot wounds of, physiological pathology of ..	123
— injuries, importance of concussion syndrome in ..	126
Head, neuralgia of (<i>see</i> Neuralgia) ..	317
Head, surgery of (<i>see</i> Cranial Surgery) ..	123
— wounds, common route of infection in ..	124
Headache, rhinogenous, cocaine for ..	349
Hearing, artificial aids to ..	131
— centres, Callahan's law of the ..	236
Hearing, mechanism of ..	236
Heart affected in influenza ..	261
— aviators, x-ray examinations of ..	30
Heart disease ..	237
— capacity for work in ..	242
— digitalis in ..	240
— electrocardiography in diagnosis of ..	237
— murmurs in ..	240
— prevention in rheumatism ..	242
— quinine in auricular fibrillation and flutter ..	242
— in scarlet fever ..	402
— skiagraphy in diagnosis of ..	239
— in syphilis ..	452
— failure, strophanthin in ..	242
Heart, irritable, etiology of ..	243
— pathology of ..	244
— physical exercises for ..	244
— prevention of ..	244
— size of, shown by x rays ..	30
— and vessels, foreign bodies in, x-ray examinations for ..	30
Heater, the 'Zeva' electric immersion ..	548
Heel cord, short ..	328
Hemihypæsthesia in Bell's palsy ..	405
Hemiparesis, complete homolateral, in cerebellar abscess ..	161
Hemil-sensory disturbances in scintia ..	404
Heredity in epilepsy ..	189
Hernia, conil depressor for ..	546
— diaphragmatic, diagnosis by x rays ..	27
Hernia, femoral ..	245
— gangrenous strangulated, Estapé's method in ..	247
Hernia, inguinal ..	245
— — La Roque's method in ..	245
— — Linnartz's stitch for closing ..	246
Heroin in empyema ..	467
Herpes and varicella ..	507
Herpes zoster ..	247
— otitis, with facial palsy and acoustic symptoms ..	213
Hexamine in encephalitis lethargica ..	181
— infectious jaundice ..	259
— pyelonephritis in children ..	114
— urinary diseases of the central nervous system ..	499
Hiccough, benzyl benzoate in ..	6
High-frequency spark with copper sulphate in chancreoid ..	109
Hip, ununited fractures of ..	524
— joint, irreducible paralytic dislocation of, operative treatment ..	526
Hodgkin's disease (<i>see also</i> Lymphosarcoma and Hodgkin's Disease) ..	294
— skin eruptions in ..	408
Homologous serum in treatment of pneumonia type I ..	366

	PAGE
'Hong-Kong foot', epidermophyton fungus, in ..	315
Hookworm disease (<i>see</i> Ankylostomiasis) ..	55
Horse serum in cahectic tuberculous children ..	20
— — — scarlet fever ..	403
Hot-air insufflations in stenosis of the external auditory meatus ..	163
Hot-water injections for lymphangiomata ..	233
Hour-glass stomach ..	412
House-fly as carrier of <i>E. histolytica</i> ..	45
Humagolan in alopecia ..	43
Hunt's geniculate neuralgia ..	213, 214
Hydatid cysts ..	247
Hydrocele, acute encysted, of spermatic cord ..	159
Hydrochloric acid in achylia gastrica ..	16
— — furunculosis ..	204
Hydrogen-ion concentration in blood chemistry ..	73
— peroxide injections in influenza pneumonia ..	264
Hydrophathic establishments ..	581
Hyoscine with morphia in blackwater fever ..	66
Hyperchlorhydria in children (<i>see</i> Children, Gastro-intestinal Disorders in) ..	111
— cause of chronic indigestion of children ..	113
Hyperkeratosis, action of pepsin on ..	17
— of lower lip, treatment for ..	170
Hypernephroma, results of operations for ..	283
Hyperplasia of lymphoid tissue, action of pepsin in ..	17
Hypertonic salines and alkalis in cholera ..	115
— salt solution for tuberculous abscess ..	481
Hyperthyroidism, proteins in ..	19
— skin appearances in ..	408
Hypertrophic pyloric stenosis (<i>see</i> Stomach, Surgery of) ..	
Hypodermic syringe, the 'Luc' ..	555
Hypophysis cerebri, defective ..	155
— — radium and x rays in tumours of ..	102
Hypopyon keratitis, antidiaphtheric serum in ..	198
— — flavine in ..	199
— — iodine in ..	13
Hypothesis, action of, on pupil ..	196
Hypothyroidism, skin appearances in ..	400
Hysterectomy: the artery of the round ligament ..	503
Hysteria, vestibular ..	165
Hysterical deafness ..	165
ICHTHYOL and salicylic acid, with chrysarobin, in psoriasis ..	373
Idiocy ..	323
— amaurotic family ..	41
Idiopathic hemorrhagic sarcoma of skin ..	115
Ileostomy in dysentery ..	46
Imbeciles, Mongolian ..	315
Immunity reactions, tests of ..	248
Impetigo, bullous, autogenous streptococci vaccines in ..	118
India, use of ether in ..	50
Indigestion of children, buttermilk in ..	113
— chronic, in children ..	112
Industrial conditions and alcohol ..	249
Industrial health ..	249
Inebriates, institutions for ..	580
Infancy, intravenous injections in ..	249
Infant feeding ..	249
— — artificial ..	250
— — breast-feeding ..	249
— — dried milk in ..	251
— — glucose or 'corn syrup' feeding in marasmus ..	252
— — Grade A certified and uncertified milks ..	250
— — lactic-acid milk in marasmus ..	252
— — and marasmus ..	252
— — top-milk mixtures in ..	251

	PAGE		PAGE
Infantile diarrhoea and vomiting	253	Intestinal stasis, chronic, radiology in ..	28
— infection in	253	Intestinal toxæmia	265
— vomiting, bismuth in	254	— antiseptics in	266
— bromide and sodium bicarbonate in ..	254	— autogenous vaccine in	266
— gastric lavage in	254	— diet in	266
— hot baths and compresses in	254	— laxatives in	266
— hot enemata in	254	— proteins in	19
— massage with camphorated oil of ..		Intestine, diagnosis of nervous disorders of, ..	
— chamomile in	254	— by x rays	27
— tincture of belladonna in	254	— test for viability of	269
Infants, breast-fed, diarrhoea in	254	Intestines, surgery of	267
— habitual vomiting in	254	Intramaine in gonococcal arthritis	230
— intestinal obstruction in	111	— for gonorrhoea in males	228
Infection, focus of, the arthritides and ..	335	— in treatment of syphilis	450
• In infantile diarrhoea and vomiting ..	253	Intravenous infusion, continuous, in loss of ..	
— and insanity	317	— blood from various causes	12
Infections of bones and joints	332	— — — peritonitis	12
Infectious diseases, peptone injections in ..	19	— injections in infancy	219
Infectious diseases prevention	253	— therapy in cerebrospinal fever	105
Infective jaundice , diagnosis, etiology, ..		Intraventricular injections in cerebrospinal ..	
and symptoms of	271	— fever	105
Influenza	259	Intussusception, acute, in typhoid fever ..	483
— appendicitis following	262	Invagination, Hieketz' method of intestinal ..	
— aseptic pleural effusions and	261	— anastomosis by	268
— bacteriology of	260	Involutional melancholia	307
— cardiac form of	261	Iodide of potassium and pilocarpine hydro- ..	
— digitals in	261	— chlorate in acute otitis media in ..	
— dyspepsia following	261	— syphilitic patients	351
— epidemic, complicated by acute osteo- ..		Iodides in acrocliosis of Castellani	412
— myelitis and perioritis	533	Iodine as antiseptic for burns	87
— epidemiology of	259	— in atonic ulcers	13
— equine, asphenamin in	4	— collosol	540
— fixation abscess by turpentine injection ..		— compresses in trachoma	122
— in	261	— content of the normal human thyroid ..	
— genito-urinary complications of	262	— gland	21
— inoculation results in	261	— as disinfectant for the skin	13
— iodine inhalations in	14	— in gonorrhoea in women	226
— mental disorders following	261	— — infections keratitis	13
— morbid anatomy of	260	— inhalations in influenza	11
— nephritis a complication of	262	— in lupus of the cornea	13
— and the nervous system	261	— — lymphatic ulcers	13
— opium in	264	— massage in lupus vulgaris	264
— in pregnancy and childbirth	263	— in nasal catarrh	83
— prognosis in	265	— in oil in bronchial spirochaetosis ..	
— prophylaxis of	261	— in ophthalmic diseases	12
— and pulmonary tuberculosis	262	— — ringworm	400, 401
— subcutaneous emphysema rare in	262	— — rheumatoid arthritis	14
— surgical complications of	262	— — sore throat	13
— symptoms of	261	— and phenol in chronic purulent otitis ..	
— thrombophlebitis following	262	— media	352
— thyroid involvement in	261	— in ulcers with hypopyon	13
• Influenzal bronchopneumonia or pneumonia, ..		— and zinc chloride in trachoma	198
— vaccine treatment in	265	Ionization in lupus vulgaris	291
— — serum treatment in	265	— — septic war wounds	38
— mastoiditis, symptomless	262	Iritis, diagnosis from glaucoma	218
— pneumonia diagnosed by x rays	26	— gonorrhoeal	196
— — hydropic prostatic infections in ..	264	— syphilitic, aspirin in	200
— — hypertonic glucose solutions in ..	11, 265	Iron in emphysema	467
— — and pneumonic plague, differences in ..		Irrigator and irrigating nozzles, urethral, ..	
— diagnosis of	263	— (Gandy Ryall's)	519
Inguinal hernia	215	Irritable heart	213
Inhaler, Rooley's, in face and neck opera- ..		Itch, double (<i>see</i> Pincz, the Higher, in ..	
tions	18	— Human Diseases)	203
— Stokes' patent inhaler	548	J JAPANESE anthrax-infected shaving- ..	
Inherited syphilis	456	— brushes	237
Injections, intravenous, in infancy	219	Jaundice in arsenobenzol treatment of ..	
Ink in ringworm	401	— syphilis	450, 451, 452
Inoculation experiments in men-fes	306	Jaundice, infective , diagnosis, etiology, ..	
— results in influenza	261	and symptoms of	271
Insane, the dress of the	321, 323	— — urotropine injection for	272
Insanity (<i>see</i> Mental Diseases)	315	— — and yellow fever	270
— and infection	319	Jaundice, hæmorrhagic	272
Instrument case, Evans'	554	Jaw, fractures of	
Intermittent claudication, paraffin-wax baths ..		— — autogenous dowel-graft in im- ..	
— in	16	— mited	272
Intestinal anastomosis	269	Jejunal and gastrojejunal ulceration	138
— colic, benzyl benzoate in	6	Jews and manure family idiosy	11
— obstruction	267	Joint, shoulder, dislocation of	335
— — in infants (<i>see</i> Children, Gastro- ..			
intestinal Disorders in)	111		

	PAGE		PAGE
Joints and bones, infections of	332	Lactic-acid milk for marasmic infants ..	252
— — — miscellaneous affections of ..	332	Lamp, electric, for ear, throat, and nose examination	547
— — — deformities and injuries of (<i>see</i> Orthopaedic Surgery)	526	Laundry's paralysis in typhoid fever ..	181
— nail, treatment of	335	Lange's colloidal-gold test of cerebrospinal fluid	106
Joints, gouty, paraffin-wax baths in ..	16	'Langue tte hépatique' (localized hypertrophy of the liver)	205
— — — painful, colloidal sulphur for ..	10	La Roque's method in inguinal hernia ..	216
— — — stiff, treatment of	335	Laryngectomy, total, for cancer of larynx ..	285
— — — syphilitic and tuberculous	336	Larynx, cancer of	285
JALA-AZAR	273	— — — radium treatment for	286
— — — antimony treatment of	273	— — — total laryngectomy for	285
— — — excision of Baghdad boil	274	— — — or trachea, post-diphtheritic stenosis of ..	151
Kurell's diet in chronic parenchymatous nephritis	271	— — — tuberculosis of, prognostic importance of	177
Keloid (<i>see also</i> Skin, General Therapeutics of)	336	Lavettes (soap powder)	540
— — — radium in	274	Laxative, confection semia c. petrolei as a ..	539
— — — surgery and radium applications in ..	418	Lead plaster, vaseline, and salicylic acid ointment in eczema of lip	170
— — — action of pepsin on	271	Leg, pseudarthrosis of	530
Keratitis, infections, iodine in	17	— — — ulcer of	188
— — — macular	13	Legg's disease, x-ray diagnosis in	31
Keratodermia hemorrhagica, gonorrhoeal ..	196	Leishmaniasis (<i>see also</i> Delhi Boil, 139) ..	271
— — — vaccinia in	418	— — — asphenamin in	1
Keratosis, solar, and cancer	415	— — — cutaneous	139
Kerion of Celsus , compresses of boiled water in	271	Leprosy	286
Kharasim in bronchial spirochaetosis ..	84	— — — after-treatment of	287
Kidney, detection of functional efficiency of ..	495	— — — chaulmoogra oil derivatives in	286
Kidney function tests	275	— — — salicylate of soda in	288
— — — hematogenous infection of	278	— — — sodium hydriocarpate and sodium morrhuate in	287, 288
— — — mixed tumours of, in children	282	— — — soyate in	287
— — — myxoma of	282	Leptospira icterohemorrhagiae and yellow fever	515
— — — resection of double	277	— — — icteroides and yellow fever	515
— — — squamous-celled carcinoma of	282	Lethal dosage of radium in malignancy ..	35
Kidney, surgery of (<i>see also</i> Ureter) ..	277	Lethargic encephalitis in girls' home ..	255
— — — Ambard's constant in	277	Lenticonus, anterior	196
— — — anomalies of renal blood-vessels ..	277	Leucocytosis (<i>see also</i> Blood, Cytology of, 75)	288
— — — cystitis cystica	278	Leucorrhoea, argentum (colloidal) in ..	538
— — — dilatation of pelvis and ureter	277	Leukemia, skin eruptions in	108
— — — hypernephroma	283	Lice and nits	288
— — — operative technique	283	— — — in the hair, lysol for	288
— — — pyelonephritic cysts	283	— — — salt water disinfection	288
— — — tumours	282	— — — in trench fever	473
— — — perinephric abscess	279	Lichen nitidus	289
— — — pyelitis and pyelonephritis	278, 280	Lichen planus (<i>see also</i> Skin Diseases, Miscellaneous)	289
— — — renal calculi	280	— — — bichloride of mercury in	290
— — — fluoroscopy	281	Life-cycles of bacteria	62
— — — pelvis as possible source of infection of blood-stream	278	Linnaert's stitch for closing inguinal hernia ..	216, 217
— — — unilateral pyelonephritis	279	Lip discoloration in typhoid fever	483
— — — ureteritis	278	— — — eczema of vermilion border of	169
— — — transplantation of	277	Lipiodol in bronchial spirochaetosis ..	83
— — — tuberculosis of	279	Lipoid constituents of blood	73
— — — x-ray examination in	279	Liquor hydragryi nitratis in carcinoma of external ear	162
Kidneys, blood-urea, estimation of function ..	275	— — — potassium in psoriasis	372
— — — decapsulation of, in nephritis	336	— — — ringworm of scalp	400
— — — diastase test of	276	Liver abscess and amebic hepatitis	46
— — — power of, to concentrate uric acid ..	276	— — — aspiration in	47
— — — urea concentration test of	275	— — — emetine in	17
Knee, flexion of	533	— — — quinine in	47
— — — neo-arthritis of	529	— — — localized hypertrophy of the	205
Knee-jerk, loss of, in typhus fever	487	Lobar pneumonia, oxygen in	16
Knife, 'Bard-Parker' operating, with detachable blades	551	Local anaesthesia	51
Köhler's disease of scaphoid bone of the foot, x-ray diagnosis of	31	— — — in nose and throat work	349
Konopar biscuits in chronic constipation ..	540	— — — prostatectomy under	370
Kraurosis vulvae (<i>see</i> Vulva)	512	Localization, cerebellar symptomatology and ..	98
Kromayer mercury vapour lamp in lupus vulgaris	291	— — — of cerebral tumours by ventriculography ..	99
Kryosolgan for tuberculous diseases of eye ..	199	Luetic test for inherited syphilis	456
LABOUR , protection of perineum in	284	Lugol's solution for gonorrhoea in children ..	228
— — — separation of placenta in	285	— — — — — women	227
Labyrinthitis (<i>see</i> Ear, Inner)		Lumbar neuralgia and sacralization of 5th lumbar vertebra	347
Lactation deficiency, placenta substance tablets for	541	— — — puncture in syphilis of central nervous system	454

	PAGE		PAGE
Lumbar puncture in cerebrospinal fever ..	104	Marasme infants, glucose or 'corn syrup' ..	252
— — — diabetes insipidus ..	145	— — — feeding in ..	252
— — — ear diseases ..	166	— — — lactic-acid milk for ..	252
Luminal for epilepsy ..	189, 190	Marasmus, infant feeding and ..	252
Lung, abscess of (<i>see also</i> Thorax, ..	290	— — — metagen in ..	510
— — — Surgery of) ..	167	'Marmite' for beri-beri ..	136
— — — and bronchiectasis ..	290	Massage with emporated oil of chamomile ..	251
— — — artificial pneumothorax in ..	290	— — — in infantile vomiting ..	116
Lung, acute oedema of ..	290	— — — of fibrillating ventricles ..	53
— — — forceps, (Glenning's) ..	517	— — — prostatic, for gonorrhoea ..	228
Lupoid syphilis (<i>see</i> Syphilis Barbae)		Mastoid disease (<i>see also</i> Ear Disease, ..	300
Lupus erythematosus, affections of mucosae ..	410	— — — Intracranial Complications of) ..	301
— — — associated with ..	118	— — — fibro-myxo-angio-epithelioma of middle ..	301
— — — of the cornea, iodine in ..	118	— — — ear and ..	301
— — — tuberculin in ..	290	— — — laboratory examinations in otology ..	301
Lupus vulgaris ..	293	— — — simulated by chloroma and malignant ..	301
— — — acid nitrate of mercury in ..	293	— — — operation, gas-embolism of lateral sinus ..	158
— — — electrotherapeutics in ..	292	— — — after ..	303
— — — electrocautery in ..	292	— — — incomplete, cause of delayed healing ..	303
— — — excision in ..	291	— — — local anaesthesia and ..	300
— — — freezing by carbon dioxide snow in ..	292	— — — stereo-radiography of ..	300
— — — improved 'picric brass' treatment ..	292	Mastoidectomy, haemorrhage after, in pur- ..	303
— — — iodine massage in ..	291	— — — juric patient ..	303
— — — ionization in ..	291	Mastoiditis, Carrel-Dakin solution in ..	302
— — — Kronmayer mercury vapour lamp in ..	291	— — — dichlorazine paste in ..	301
— — — pyrogallie acid in ..	292	— — — eye sign in ..	301
— — — salvarsan in ..	291	— — — serum treatment in ..	303
— — — scarification and cauterizing in ..	293	— — — and suboccipital Pott's disease ..	302
— — — tuberculin in ..	292	— — — symptomless influenzal ..	302
— — — tungsten light in ..	291	— — — and tonsillitis ..	302
— — — x rays in ..	291	Materia medica, dictionary of ..	301
Lymphangiomata , boiling water in- ..	233	Maternity and child welfare ..	306
— — — jections for ..	233	Measles ..	306
Lymphatic glands, invasion in cancer of ..	169	— — — blood-injection from brother who had had ..	207
— — — tongue ..	13	— — — the disease ..	207
Lymphosarcoma and Hodgkin's ..	291	— — — bullous eruption complication of ..	206
disease ..	291	— — — cerebellar involvement in ..	206
— — — — radium and x rays in ..	288	— — — convalescents' serum in ..	207
Lyol for lice and nits in the hair ..	288	— — — diagnosis of ..	207
		— — — haemorrhage ..	206
		— — — inoculation experiments ..	206
		— — — meningitis-encephalitis in ..	206
		— — — nervous complications in ..	206
		— — — Pfeiffer's bacillus in ..	206
		— — — prophylaxis in ..	207
		— — — Mont diet in serum ..	228
		Meatus, external, syphilitic papules in ..	163
		Meckel's ganglion, neuralgia associated ..	313
		Medical professional secrecy ..	388
		Medical and surgical appliances ..	313
		Medico-legal cases—public health adminis- ..	388
		— — — tration ..	323
		Melancholia ..	307
		Melancholia, involutional ..	307
		Melano-epithelioma, secondary, of bladder ..	69
		Ménière's disease (<i>see</i> Vertigo) ..	511
		Meningeal manifestations in typhoid fever ..	481
		— — — reaction in typhus fever ..	487
		Meningitic neurolymphitis ..	163
		Meningitis, hyaline of meningeal spaces in ..	157
		— — — secondary to ear disease (<i>see</i> Ear Disease) ..	157
		Meningitis, serous spinal , diagnosis ..	312
		— — — and treatment ..	310
		— — — — etiology ..	310
		— — — — symptomatology ..	310
		Meningitis, tuberculous ..	312
		— — — antituberculoec serum in ..	312
		Meningo-encephalitis in measles ..	306
		— — — and mumps ..	328
		Menopause symptoms, ovarian residue in ..	15
		Menorrhagia, radium in ..	31
		— — — x-ray treatment of ..	31
		Menses, delayed, ovarian residue in ..	16
		Mental condition in cansalgin ..	96
		— — — pellagra ..	137
		Mental deficiency ..	313
		— — — certified institutions and homes for ..	311
		— — — and criminality ..	311

	PAGE		PAGE
Mental deficiency, institutions and private mental homes	370	Ministry of Health	389
-- Mongolian imbecile form	315	Moebius's antithyroid serum in diabetes	149
-- tests	313, 314	-- mellitus	141
Mental diseases	315	Moeller's glossitis	411
-- "collectionism" in	322	Mongolian imbeciles	315
-- the coverings of the insane	323	Monilia infections	201
-- dementia	323	-- psilosis and sprue	128
-- the dress of the insane	321	Morphea in blackwater fever	66
-- "hallucinationism" (destructive hypnoses) in	322	-- oedema	368
-- hallucinations in	320	-- empyema	167
-- idiocy	323	-- glaucoma	216
-- insanity and infection	319	-- shock from burns	86, 87
-- melancholia	323	Mosquito control of malaria	295
-- mental confusion	323	Motility, disorders of	325
-- nudism in	322	-- relation of the dual system of, to symptomatology	326
-- psychopathology of	316	Mucosa, affections of, associated with lupus	
-- the psychoses and neuroses in	317	-- erythematous	410
-- systematized psychoses	323	-- " " skin diseases	410
-- disorders after influenza	261	-- " " in erythema multiforme	411
Mental troubles of syphilis	323	-- " " pemphigus	411
Mercurochrome-220 and acriflavine in chronic purulent otitis media	352	Multiple sclerosis	405
-- for buboes	15	Mumps, bacteriology of	327
-- in chancrelids	15	-- cases of chronic parotitis or pseudo-mumps	328
-- cystitis	15	-- duct sign in	328
-- gonorrhoea	15	-- and enlargement of the thymus	328
-- pyelitis	15	-- haematoma of the ovary	328
-- as a urinary anti-septic	15	-- meningio-encephalitis	328
Mercury, acid nitrate of, in lupus vulgaris	293	-- neuritis	328
-- bichloride in Hebra planus	290	-- symptoms of	328
-- chloride in cataract	93	Murmurs in heart disease	210
-- cyanide in sycoosis barbae	445	Muscle function, interpretation of, in its relation to injuries of peripheral nerves	530
-- " " trachoma	122	-- and nerve injuries, electricity in	38
-- and clarsenol in nortic aneurysm	54	Muscles and joints, painful conditions of, colloidal sulphur in	10
-- infectious and grey powder in syphilitic newborn children	457	Muscular rheumatism, vaccines in	22
-- lactate in habitual vomiting of inherited syphilis	457	Myiasis, chloroform in	329
-- peptonate of, with sodium cacodylate, in cataract	93	Myocardial changes in diphtheria	150
-- perchloride and alkalis in blackwater fever	66	Myoclonus multiplex, acute infectious, and epidemic	320
-- in endocarditis	181	Myokymia	330
-- in injections for infected ulcers of cornea	189	Myxochondrosarcoma of femur, x-ray appearances	32
-- in otomycosis	163	Myxoma of kidney	282
-- for trachoma	121		
-- test for excretion of calomel	15		
-- treatment in syphilis of central nervous system	453		
-- vapour lamp (Kronmayer) in lupus vulgaris	291		
Metabolism apparatus, Sanborn	549		
Metagen in deficiency diseases	510		
Metastatic carcinoma of ear	168		
Methylene blue for gonorrhoea in women	226		
Methanamine with acid phosphate of soda in cystitis and genito-urinary troubles	510		
Microfilaria bancrofti in filariasis	202		
-- immitis in filariasis	202		
Microscope, new, for observation of skin capillaries	416		
Microscopical examination of faces	201		
Middle-ear disease (see Otitis Media)	550		
Migraine, aspirin tablets in	512		
Milk (see also Protein Therapy)	19		
-- dried, in infant feeding	251		
-- Grade A certified and uncertified in infant feeding	250		
-- injections in gonorrhoea and bubo	230		
-- intramuscular injections of, in arthritis and gonorrhoeal arthritis	20		
-- lactic-acid, for marasmod infants	252		
-- mixtures, value of top-milk in infant feeding	251		
-- ower and maternity and child welfare	305		
-- parenteral injections of	20		
-- subcutaneous use of, in young children	19		
Miner's nystagmus	165		
Mineral constituents of blood	73		
		Moebius's antithyroid serum in diabetes	149
		-- mellitus	141
		Moeller's glossitis	411
		Mongolian imbeciles	315
		Monilia infections	201
		-- psilosis and sprue	128
		Morphea in blackwater fever	66
		-- oedema	368
		-- empyema	167
		-- glaucoma	216
		-- shock from burns	86, 87
		Mosquito control of malaria	295
		Motility, disorders of	325
		-- relation of the dual system of, to symptomatology	326
		Mucosa, affections of, associated with lupus	
		-- erythematous	410
		-- " " skin diseases	410
		-- " " in erythema multiforme	411
		-- " " pemphigus	411
		Multiple sclerosis	405
		Mumps, bacteriology of	327
		-- cases of chronic parotitis or pseudo-mumps	328
		-- duct sign in	328
		-- and enlargement of the thymus	328
		-- haematoma of the ovary	328
		-- meningio-encephalitis	328
		-- neuritis	328
		-- symptoms of	328
		Murmurs in heart disease	210
		Muscle function, interpretation of, in its relation to injuries of peripheral nerves	530
		-- and nerve injuries, electricity in	38
		Muscles and joints, painful conditions of, colloidal sulphur in	10
		Muscular rheumatism, vaccines in	22
		Myiasis, chloroform in	329
		Myocardial changes in diphtheria	150
		Myoclonus multiplex, acute infectious, and epidemic	320
		Myokymia	330
		Myxochondrosarcoma of femur, x-ray appearances	32
		Myxoma of kidney	282
		NEVI in children, electrolysis for	38
		-- port-wine, quartz lamp in	118
		-- radium in	118
		Naphthol-camphor, oxidized, for trachoma	122, 198
		Nasal accessory sinuses	331
		-- of children	332
		-- external surgery of	331
		-- gunshot wounds of	331
		-- loss of vision from disease of	332
		-- sphenoidal empyema and epidemic cerebro-spinal fever	332
		-- treatment of malignant tumours of antrum	333
		-- catarrh, iodine in	13
		-- tablets	511
		Nasal dermatitis (see also Dermatitis)	141
		-- silver nitrate lotion in	141
		-- drill in diseases of tonsils	470
		-- inhaler, Stokes' patent	518
		National Insurance cards, cabinet for	516
		Nausea, tablets, improved	511
		Neck operations, anaesthesia in	48
		Necrosis, fat, of female breast	82
		Needle and suture carrier, Guthrie's	519
		Neo-arsphenamin (see Arphenamin)	1
		-- in chronic bronchitis	85
		-- congenital atrophy due to inherited syphilis	157
		Neo-arthritis, especially of knee-joint	529
		Neoplasms, x-ray treatment of	36

	PAGE		PAGE
Neosalvarsan in cardiovascular syphilis ..	453	Neuralgia, trifacial, deep alcohol injections in ..	815
-- polyneuritis and exfoliative dermatitis following ..	150	-- -- palliative treatment versus radical treatment of ..	347
-- In relapsing fever spread by lice ..	396	-- from tumour involvement ..	344
-- -- syphilis of central nervous system ..	453	-- -- vaccineurine in ..	542
-- -- yaws ..	515	Neurasthenia, tetraglandin palatinols in ..	512
Nepeta cistriflora ferment in trachoma ..	200	Neurasthenic, symptoms of the ..	378
Nephritis ..	334	Neuritis, colloidal sulphur in ..	10
-- autogenous vaccines in ..	335	-- compression, due to normal first dorsal rib ..	107
-- bacteriology of ..	338	-- and mumps ..	328
-- bleeding for elimination of toxic substances in ..	336	-- optic, in typhus fever ..	487
-- calcium lactate in ..	356	-- paraffin-wax baths in ..	16
-- chronic parenchymatous, Epstein's high-protein diet in ..	336	-- vaccines in ..	22
-- -- Karrell's diet in ..	336	-- vaccineurine in ..	542
-- combined with diabetes, salt and protein-free diet in ..	150	Neurilabyrinthitis, meningitic ..	163
-- decapsulation of kidneys in ..	336	Neurological psychopathology ..	377
-- and diabetes mellitus ..	150	Neurology, urology in (see Urological Findings in Diseases of Central Nervous System) ..	198
-- diet and rest in bed for ..	335, 336	Neuroses, proteals in ..	19
-- nephrotomy in ..	336	Neurotic excretions of the skin ..	412
-- post-influenzal ..	262	Neurotropic strain of spirochæta pallida ..	155
-- purpura, in children ..	114	Newborn, cerebral hæmorrhage in ..	99
-- scarlatinal, malt coffee and sugar in ..	403	-- children, syphilitic, galyi infectious in ..	457
-- and uræmia ..	335	Night sweats in pulmonary tuberculosis, epinephrin for ..	478
-- war ..	336	Nitric acid injections in bladder growths ..	69
-- -- and trench fever ..	337	Nitrous oxide, prolonged administration of ..	51
Nerve and muscle injuries, electricity in ..	38	Nits and Lice ..	288
-- -- pains, aspirin tablets in ..	542	Nocardiosis, potassium iodide in ..	412
Nerves, peripheral, abnormal distribution of ..	338	-- resembling sporotrichosis ..	412
-- -- difficulties in diagnosis of nerve function ..	338	Noma of hand ..	348
-- -- -- motor diagnosis ..	338	Non-protein and urea nitrogen of blood ..	71
-- -- electrical examination of injuries of ..	339	Normal saline (see Saline, Normal) ..	
-- -- stimulation of nerves at operation ..	341	Nose, bacterial flora of, modifications of ..	348
-- -- utility of bridging nerve defects by means of nerve flaps ..	341	Nose, diseases of (see also Nasal Accessory Sinuses; Ozena) ..	348
-- -- observations on 500 cases of injuries of ..	339	-- -- rhinogenous headache, cocaine for ..	349
-- -- results of bridging gaps in injured nerve-trunks by autogenous fascial tubulization and autogenous nerve-grafts ..	340	-- -- and throat operations, anaesthesia in ..	49
-- -- sensory difficulties and errors in diagnosis ..	338	-- -- -- work, local anaesthesia in ..	349
-- -- spontaneous regeneration of ..	343	Note book and addresses ..	801
Nerves, peripheral, surgery of (see also Causalgia, 96) ..	338	Novarsenobenzol in bronchial spirochaetosis ..	84
-- -- treatment ..	339	-- -- malaria ..	299
-- -- of denervated muscle and the 'disuse' theory ..	341	-- -- syphilis of central nervous system ..	153
-- -- trophic and vasomotor disturbances ..	339	Novarsenobillon in yaws ..	515
Nervous complications in measles ..	306	Nuclein tablets to increase the leucocytes in the blood ..	541
-- system, central, syphilis of (see Syphilis of the Central Nervous System) ..	453	Nudism in mental diseases ..	322
-- -- urological findings in diseases of (see Urological Findings in Diseases of Central Nervous System) ..	498	Nursing institutions and private nursing homes ..	585
-- -- and influenza ..	261	Nutrition, blood-cells and ..	78
Neuralgia ..	313	Nutritive ciema in gastric ulcer ..	209
-- accredited to the geniculate ganglion ..	344	Nystagmus, miner's ..	195
-- -- sphenopalatine (Meckel's) ganglion ..	343		
-- facial, diagnosis and varieties of ..	343	O BSTETRIC helper ..	350
-- -- facialis vera ..	344	Obstruction, intestinal ..	267
-- -- of head ..	347	Obturation of bone cavities by muscle strips ..	536
-- -- bruising of painful points for ..	347	Ocular muscles, disturbance of balance of ..	195
-- -- -- 213, 214, 314 ..	344	-- -- therapeutics, radium in ..	200
-- lumbar, and sacralization of 5th lumbar vertebra ..	347	-- -- tuberculin in ..	200
-- major trigeminal, and surgical treatment ..	343	-- -- vaccine in ..	200
-- minor trigeminal ..	345	Edema, acute, of lung ..	290
-- painful tic convulsif ..	344	-- -- war or hunger (see Deficiency Diseases) ..	
-- post-zoster ..	344	Painful Dropsy) ..	
-- Sluder's ..	343	Oesophagoscopy and bronchoscopy ..	85
-- trifacial, cutting sensory root of Gasserian ganglion in ..	346	Official and trade directory ..	591
		Ointment applicator ..	550
		Old-age deafness ..	161
		Oligomenorrhœa, ovarian residue in ..	16
		Olive oil in gastric ulcer ..	211
		Omniopon ..	542
		Onchocera volvulus in cutaneous filariasis ..	411
		Open-air method for burns ..	88
		Operability of cancer of stomach determined by x rays ..	27
		Operation in amoebic hepatitis and liver abscess ..	47

	PAGE		PAGE
Ophthalmia neonatorum, flavine in ..	199	Pancreas, failure of internal secretion of ..	555
— nitrate of silver in ..	122	Pancreas, surgery of ..	556
— serofulous, silver fluorescein in ..	199	Pancernitis, acute and chronic ..	554
— sympathetic, salvarsan in ..	200	Pankron in diabetes mellitus ..	148
Ophthalmic diseases, iodine in ..	13	Panophthalmitis due to <i>B. coli</i> , vaccine in ..	198
Ophthalmic surgery (<i>see also</i> Eye Operations) ..	193	Papaverine sulphate injection for ureteric stones ..	190
— flavine in ..	199	Papilloma of ureter ..	492
Opium, camphorated tincture of, in bacillary dysentery ..	157	Papular itching eruption of axilla and pubis ..	113
— in influenza ..	264	Paraffin-wax for burns ..	87
Opothrapy in diabetes mellitus ..	149	— baths in eczema vesiculosum ..	16
Optic neuritis in typhus fever ..	487	— — — fibrositis of smaller joints ..	16
Oraloids (antiseptic throat tablets) ..	541	— — — intermittent claudication ..	16
Orcitis and epididymitis following paratyphoid fever ..	359	— — — local circulatory defects ..	16
Organic acids in urine, tests for ..	496	— — — neuritis ..	16
Oriental sore, x-ray treatment in ..	35, 274	— — — orthopaedic disorders ..	16
Orthopaedic disorders, paraffin-wax baths in ..	16	— — — rheumatic and gouty joints ..	16
Orthopaedic surgery ..	515	— — — scleroderma ..	16
Ossification in bones of hands, x-ray diagnosis in ..	31	Paraline for ureteric stones ..	490
Osteitis of skull, gummatous, surgical treatment of ..	125	Paralysis agitans syndrome following cephalitis lethargica ..	174, 175
Osteochondral trophopathy of the hip-joint, x rays in ..	31	Paralysis, general (<i>see</i> Syphilis of Central Nervous System) ..	453
Osteomalacia and rickets ..	135	— Landry's, in typhoid fever ..	181
Osteomyelitis, acute, and periostitis, complicating epidemic influenza ..	533	Paramyoclonus multiplex and myokymia ..	330
— from the clinician's standpoint ..	532	Paraneuritic cysts ..	285
— fulminant otogenous of temporal bone in children ..	351	— tumours ..	282
Otitis in acute inflammation of middle ear ..	541	Paratyphoid A bacillus ..	558
Otitic brain abscess, pathology and symptomatology of ..	159	— B bacillus and suppurative arthritis ..	559
— treatment of ..	180	— food-poisoning outbreak due to ..	256
Otitis media ..	350	— C bacillus ..	559
— acute, in syphilitic patients ..	351	— cholecystitis ..	558
— in baths ..	350	Paratyphoid fever ..	558
— chronic purulent, treatment ..	351, 352	— — — orchitis and epididymitis following ..	559
— suppurative ..	351	— group of bacilli ..	360
— cocaine, carbolic, and glycerin drops in ..	350	— infection and typhoid fever ..	481
— dry heat in ..	350	Parenteral injections of milk ..	20
— scarlatinal ..	351	Paresis, general, and syphilis ..	454
Otogenous osteomyelitis, fulminant, of temporal bone in children ..	351	Parotitis, chronic ..	328
Otology, laboratory examinations in ..	501	— complication of typhus fever ..	487
Otomycosis ..	162	Parotitis, suppurative ..	360
Otosclerosis , ..	352	Patella, abnormality of, x rays in ..	31
— adrenalin in ..	352	Paul's test in diagnosis of small-pox ..	420
Ovarian residue in amenorrhoea ..	16	Pellagra, etiology and treatment ..	136
— clotting ..	16	— mental conditions in ..	137
— delayed menses ..	16	— metagen in ..	310
— dysmenorrhoea ..	16	Pelvic appendix, relationship of, to obturator internus muscle ..	57
— menopause symptoms ..	15	Pelvis and ureter, causes of dilatation of ..	277
— oligomenorrhoea ..	16	Pemphigus, lesions of mucosa in ..	111
Oxygen in anoxaemia ..	16	Pemphigus vegetans ..	361
— bronchitis ..	16	Pepsin, action in hyperplasia of lymphoid tissue ..	17
— cyanosis ..	16	— — — on electrical tissue and various skin diseases ..	17
— empyema ..	467	— — — skin ..	16
— lobar pneumonia ..	16	— solution in drug treatment ..	17
Ozena ..	352	Petiole injections in acute polyarticular rheumatism ..	19
— respiratory re-education in ..	352	— — — bronchial spirochaetosis ..	81
		— — — infectious diseases ..	19
		— — — non-rheumatic arthritis ..	19
		— — — septicaemia ..	19
		— — — typhus fever ..	488
		— shock ..	18
		— treatment in asthma ..	61
		Peri-arterial sympathectomy in causalgia ..	97
		Pericarditis ..	361
		— effusions in pericardial sac ..	361
		— pericardial adhesions ..	361
		— with effusion, x-ray examinations in ..	30
		Perineal prostatectomy, two-stage ..	370
		Perinephric abscess ..	279
		Perineum, protection in labour ..	281
		Periodicals, medical and scientific ..	595
		Periostitis and acute osteomyelitis complicating epidemic influenza ..	533
		Peripheral nerves (<i>see also</i> Nerves, Peripheral) ..	
PAGET'S disease of the breast ..	83		
Pain in diseases of central nervous system ..	499		
Pallamine (colloidal palladium) in gonorrhoea ..	228, 541		
— — — as a reducing agent ..	539		
Pancreas, cancer of ..	357		
Pancreas, clinical pathology of ..	353		
— cysts of ..	356		
— disease of, and Cammidge's reaction ..	356		
— — — creatorrhoea in ..	355		
Pancreas, disease of, diagnosis of ..	353		
— — — Loew's adrenalin test in ..	354		
— — — steatorrhoea in ..	354		

	PAGE		PAGE
Peripheral nerves, injuries of, interpretation of muscle function in its relation to ..	530	Pneumothorax, artificial, in abscess of lung ..	380
Peripheral nerves, surgery of ..	538	— — — pulmonary tuberculosis ..	178
Peristalsis, excessive intestinal, benzyl benzoate in ..	6	Pneumoventriculography, localization of cerebral tumours by ..	99
Peritoneum forceps, Pannett's ..	518	Polio-encephalomyelitis, acute (X disease) ..	367
Peritonitis, continuous intravenous infusion indicated ..	12	Pollen extract in hay fever and asthma ..	61
Pernikanates in cholera ..	115	— vaccine in rugweed dermatitis ..	141
Pertussis (<i>see</i> Whooping-cough) ..	513	Polycythemia, skin capillaries in ..	416
Pfeiffer's bacillus in relation to measles and influenza ..	306	— x-ray treatment of ..	35
Phagedenic chancreoid, action of pepsin on ..	17	Polyneuritic syndrome, acute infectious enteritis with a ..	181
Phakolytic serum and cataract ..	92	Polyneuritis and exfoliative dermatitis following neosalvarsan ..	450
Pharmacy, progress of ..	538	Polyp of stomach, x-ray examinations in ..	27
Pharyngospasm , Bouchard rubber sounds in ..	362	Port-wine naevi, quartz lamp in ..	418
— cold-water compresses in ..	362	Post-diphtheritic stenosis of larynx or trachea ..	151
Pharynx, cancer of ..	362	Post-operative treatment by large enemata ..	51
— — — Trotter's lateral pharyngotomy in ..	363	Potassium bicarbonate in blackwater fever ..	66
— carcinoma of the post-cricoid region ..	362	— iodide in aortic aneurysm ..	54
Phenol in ringworm ..	401	— — — cataract ..	93, 91
— and tincture of iodine in chronic purulent otitis media ..	352	— — — neorailosis ..	412
Phlegmonous gastritis ..	434	— mercuric iodide as a germicide ..	17
Phosphorus in spasmophilia ..	422	— permanganate douches for cervicitis ..	226
Phosphorobia, colloidal sulphur in ..	10	— — in chancreoid ..	109
Physiological pathology of gunshot wounds of head ..	123	— — gonorrhoea in males ..	228
Physostigmine salicylate in cataract ..	93	— — small-pox ..	420
Picro acid in glycerin for gonorrhoea in women ..	225	— — — staphylococci infections of lower extremities ..	17
— brass treatment, improved, in lymus vulgaris ..	292	Pott's disease, mastoiditis and ..	303
Piles (<i>see</i> Hemorrhoids, Internal) ..	235	Poultice, puiticene as a ..	541
Pilocarpine hydrochlorate and iodide of potassium in acute otitis media in syphilitic patients ..	351	Pregnancy and childbirth, influenza in ..	263
— in glaucoma ..	215	Pregnancy, disorders of ..	368
Pituitary extract in cancer of tongue ..	469	— in pulmonary tuberculosis ..	474
— — — diabetes insipidus ..	145	— the eye in ..	193
— — — mellitus ..	149	Pregnant women and arsenical treatment of syphilis ..	157
— gland, defective ..	155	Primula officinalis, expectorant action of ..	17
— tumours, Röntgen-ray and radium treatment of ..	102	Prop for maintaining patients in Fowler position ..	550
Pituitrin, action of ..	17	Prophylactic inoculation in cholera ..	114
— and digitalis in shock from burns ..	87	Prostate and vesicles in diseases of central nervous system ..	499
Placenta, separation of in labour ..	285	— chronic abscess of ..	372
— substance tablets ..	511	Prostate, surgery of ..	369
Plantar warts, x-ray treatment results ..	513	Prostatectomy, indications and contra-indications for ..	369
Pleural effusions, clinical pathology of ..	361	— mammary glands enlargement after ..	372
— — — aseptic, and influenza ..	261	— suprapubic, calcium chloride for prevention of serious hemorrhages in ..	371
Pleurisies, serofibrinous, x-ray diagnosis of ..	29	— two-stage perineal ..	370
Pleurisy ..	365	— under local anesthesia ..	370
— acute purulent ..	161	Prostatic ambulant post-operative treatment ..	372
— breathing exercises in treatment of after-effects ..	365	— calculi ..	372
— serofibrinous, induced pneumoserosa in treatment of ..	365	— massage for gonorrhoea in males ..	228
Plication method of treatment in mobile colon ..	120	Protargol for gonorrhoea in women ..	225, 226
Pneumonia , active immunity established by experimental ..	365	— trachoma ..	121
— chronic, aspidosperma in ..	7	Proteal injections in relapsing serum sickness ..	19
— influenza, diagnosed by x rays ..	20	Proteins in anemia ..	19
— hypertonic glucose solutions in ..	11	— — — arthritis ..	19
— vaccine treatment in ..	265	— — — cancer ..	19
— Johar, oxygen in ..	16	— — — hyperthyroidism ..	19
— sodium citrate in ..	366	— — — intestinal toxicemia ..	19
— type I, codeine in ..	366	— — — neuroses ..	19
— — — digitalis and whisky in ..	366	— — — psychoses ..	19
— treated by homologous serum ..	366	— — — tuberculous ..	19
— with delayed resolution in syphilitic soldiers, arsphenamin in ..	366	Protein content of cerebrospinal fluid ..	106
Pneumonic plague and influenza pneumonia, differential diagnosis of ..	283	— sensitization in asthma and hay fever ..	62
Pneumoperitoneum, artificial, radiography in ..	32	— therapy (<i>see also</i> Serum Therapy) ..	18, 20
Pneumoserosa, induced, in treatment of serofibrinous pleurisy ..	365	Protoplasma, non-specific activation of ..	18
		Protosol for trachoma ..	121
		Protozoal diseases, arsphenamin in ..	4
		Pruritus ani, x-ray treatment of ..	36
		— quartz lamp in ..	418
		Pseudarthrosis of leg ..	380
		— — neck of femur, Albee's method of treatment ..	580
		Pseudo-mumps ..	328
		Pseudomyxoma peritonei ..	40

	PAGE		PAGE
Psoriasis (<i>see also</i> Skin, Genital Therapeutics of, 418)	372	Pyelonephritis in children, autogenous vaccines in	111
— arsenic in	372	— epinephrin and hexamine in	113
— chrysarobin with salicylic acid and ichthyol in	372, 373	— prognosis	114
— coal tar in	373	Pyloric orifice , congenital narrowness of	26
— liquor potasse in	372	— x-ray diagnosis in	26
— pyramidon in	373	— stenosis, congenital hypertrophic (<i>see</i> Stomach, Surgery of)	135
— quartz lamp in	418	— — — — — Rammstedt's operation for	436
— of scalp, oil of cade and sulphur in	373	— — — — — Tyrrell Gray's knife and separator for operation in	436
— skin capillaries in	416	Pylorospasm , benzyl benzoate in	6
— sulphur injections for	373	Pyorrhea , argentum (colloidal) in	538
— x rays for	373	Pyramidon in psoriasis	373
Psycho-analysis in non-medical practice	386	Pyrogallic acid in lupus vulgaris	290
Psycho-analytic (arrest and regression) aspect of psychopathology	377		
Psychogenic and organic factors in psychopathology	376	Q	
Psychological medicine	373	— QUARTZ lamp in acne vulgaris	418
Psychoneuroses , abreactive method in treatment	381	— — — alopecia areata	418
Psychoneuroses , causation of the	374	— — — eczema	418
— dream interpretations of	382	— — — port-wine naevi	418
— early environmental causes of	374	— — — pruritus	418
— and emotions	374	— — — psoriasis	418
— hereditary causes of	374	— — — ulcers	418
— immediate causes of	376	Quebracho (<i>see</i> Aspidosperma)	5
— medico-legal considerations—shell-shock and crime	387	Quinine in auricular fibrillation and flutter	212
— predisposing physiological causes of	375	— — — liver abscess	47
— psychorganic causes of	375	— — — malaria	205, 206, 207, 208
— rapid analysis method in	384		
— results of treatment in shell-shock cases	385	R	
— scope of the	371	— RABBIT serum in diabetes mellitus	148
— treatment of	379	— — — severe haemorrhage	20
— — by persuasion	380	Radio-activity and electrotherapeutics	24
— — — redirection of psychophysical energy	380	Radiographic rarities	32
— — — suggestion	381	Radiography in artificial pneumoperitoneum	32
— — — dealing with the exciting cause (analysis)	382	— — chronic intestinal stasis	28
— — — which deals with the central emotion	380	— — of mastoid	300
Psychopathology	376	Radiotherapy (<i>see also</i> X Rays)	33
— biological	378	— in malaria	290
— neurological	377	— in sarcoïd tuberculosis of skin	413
— of mental disorders	316	Radium in actinomycosis	35
— psycho-analytic: arrest and regression	377	— apparatus for treatment of the mouth, uterus, and bladder	33
— psychogenic and organic factors in	376	— applications and surgery in keloids	274
— and suggestion	379	— applicator, Freer's, for use in cancer of larynx	286
Psychophysical energy, redirection of	380	— in basal-celled epithelioma	418
Psychorganic cases of psychoneurosis	375	— — — benign cystic epithelioma with xeroderma pigmentosum	191
Psychoses and neuroses in mental diseases	317	— — — cancer	33, 89, 418
— proteals in	19	— — — of cervix and uterus	33, 34, 501
Pterygium , malignant, fibrolysin in	122	— — — external ear	162
Pubis and axilla, chronic papular itching eruption of	413	— — — larynx	286
Public health administration	388	— — — mouth	33
— — — and medical professional secrecy	388	— — — cataract	92
— — — Ministry of Health	389	— — — cerebral tumours	101
— — — ventilation as a science	389	— — — eczema of lip	170
Pulmonary artery, right, traumatic aneurysm of	509	— — — enlarged thymus glands in infants	36
Pulmonary embolism	170	— — — exophthalmic goitre	37
— spiriochetosis, arsenphenamin in	1	— — — glione retina	55
— tuberculosis (<i>see also</i> Tuberculosis, Pulmonary)	474	— — — gynaecology	31
— — and diabetes	150	— — — keloid	418
— — and influenza	262	— — — lethal and erythema dosage of, in malignancy	35
— — — and influenza	541	— — — leucocytic blood-content of those handling	33
Purpura annularis telangiectodes (Majocchi)	390	— — — in lupus erythematosus	418
— of urinary tract	70	— — — lymphosarcoma and Hodgkin's disease	291
Purpuric patient, hæmorrhage after mastoidectomy in	303	— — — malignant bladder tumours	69
Pyelitis	278	— — — disease of bladder and male genital organs	37
— and cerebrospinal fever	104	— — — menorrhagia	31
— — — mercurochrome-220 in	15	— — — myoma and myopathic uterine bleeding	507
Pyelonephritis	278, 279	— — — naevi	418
		— — — ocular therapeutics	206
		— — — sarcoma	118
		— — — squamous-celled carcinoma	418
		— — — tuberculous adenitis	36

	PAGE		PAGE
Radial in tumours	37	Rheumatism, colloidal sulphur in	10
--- of the hypophysis cerebri	103	--- gonorrhoeal, vaccines in	22
--- uterine bleeding	501	--- muscular, vaccines in	22
--- war injury conditions	35	--- prevention of heart disease in	212
--- warts	418	--- salicylic acid in	2
Radius and ulna, fractures of	522	Rheumatoid arthritis, antirheumatic vaccine in	538
Rauwolf dermatitis, pollen vaccine in	144	--- iodine in	11
Rammstedt's operation for congenital hypertrophic pyloric stenosis	436	Rhinogenous headache, cocaine for	349
Ranula	391	Rhinophyma	399
Rashes in the form of erythema in cases of varicella	507	Rib, normal first dorsal, compression neuritis due to	107
Rat-bite fever, arsenphenamin in	4	Ribs, cervical and first dorsal	107
Rats, splenectomy in	41	Rickets, cod-liver oil for	135
Raynaud's disease, skin capillaries in	417	--- as a deficiency disease	131
Reactions, immunity	218	--- late rickets, and osteomalacia	135
Rectal disease, diagnosis of	392	--- metagen in	540
--- ether anaesthesia	50	Ricketts' method of intestinal anastomosis by invagination	268
--- salines in blackwater fever	66	Ringworm (<i>see also</i> School Medical Service)	399
--- splinter in diseases of central nervous system	499	--- ink in	401
Rectum, cancer of	393	--- iodine in	401
--- excision of, new technique for	394	--- Jere's fluid or carbolic in	401
Rectum, foreign bodies in	394	--- of scalp, ammoniated mercury ointment in	400
Rectum, stricture of (non-malignant)	391	--- ethyl chloride in	400
Re-education in dementia praecox	112	--- liquid ethereal soap in	400
Reflex signs useful in examining for deafness	129	--- liquor potass. in	400
Reflexes, abdominal	41	--- tinct. iod. iitis in	400
Refraction errors and vertigo	511	--- in schools	403
Relapsing fever (<i>see also</i> Tick Fever)	395	--- sulphur ointment in	404
--- arsenobillon in	395	--- white precipitate ointment in	404
--- arsenphenamin in	4	--- x-ray treatment in	404
--- spread by lice	396	Rocky, s. inhaler in face and neck operations	48
--- neosalvarsan in	396	Rodent ulcer	400
Remedies, dictionary of	1	Rodet's serum in typhoid fever	485
Renal blood-vessels, anomalies of	277	Roenne's step and Bjerrum's sign in glaucoma	218, 219
--- colic, benzyl benzoate in	6	Rohmer's auto-serum for inflammatory diseases of the eye	198
--- fluoroscopy in surgery of the kidney	281	Röntgen rays (<i>see</i> X Rays)	
--- functional efficiency tests (<i>see</i> Kidney Function Test-s)	275	Round-worms, chenopodium oil capsules in	539
--- glycosuria	116		
--- pelvis, possible source of infection of blood-stream	278		
--- stones	490	SACHS-GEORGI serum reaction for syphilis	446
--- surgery, Ambard's constant in	277	Salicylate of soda in leprosy	288
--- tuberculosis	279	Salicylic acid and ichthyol, with chrysarobin, in psoriasis	373
--- tumours	282	--- ointment in carcinoma of external ear	162
--- and ureteric calculi	280	--- in rheumatism	2
Resorcin in extract	93	--- scabies	2
--- lotions for dermatitis	115	--- sulphur ointment in chronic itch	204
--- and tinct. benzoin. co. in tinea imbricata	201	Saligenin as an anæsthetic	20
Respiratory complications of scarlet fever	102	Saline in blackwater fever	65
Respiratory function, clinical studies of	396	--- and brandy injections in shock from burns hypertonic, in tuberculous abscesses	86
--- paralysis in brain abscess	161	infusion apparatus with unbreakable reservoirs	551
--- re-education in oæma	352	normal, in bacillary dysentery	157
Rest in gastric ulcer	209	--- typhus fever	188
Resuscitation in syncope of anaesthesia	53	Salvarsan in lupus vulgaris	292
Reticulo-endothelial system	79	--- sympathetic ophthalmia	200
Retina, congenital multifocal cysts of the	397	Salvarsanized serum in typanosomiasis	473
--- detachment of the	398	Sanatoria for consumption	581
--- salted gelatinized serum injections for	199	Sarcoid tuberculosis of skin	413
Retina, diseases of	397	Sarcoma of clavicle	117
--- embolism of the central artery	397	--- radium in	418
--- family degeneration of the macula lutea	397	--- of skin, idiopathic haemorrhagic	115
--- regeneration of the	397	--- stomach	130
Retinitis in varicella	507	--- x-ray treatment of	36
Retractors, glass brain	545	Sarcopotes hominis, life history of	401
Rigadin skin-flaps, technique for	119	Sautern pessaries for gonorrhoea in women	225
Rheumatic and gouty joints, paraffin-baths in	16	Scabies	400
Rheumatism, acute polyarticular, septone injections in	49	--- copper sublimate solution in	400
--- antirheumatic vaccine in	538	--- Eilers' formula in treatment of	400
		--- life history of <i>Sarcopotes hominis</i>	401
		--- scalp, ringworm of (<i>see also</i> Ringworm)	400
		--- transplantation in alopecia	43

	PAGE		PAGE
Scalps with detachable blades	551	Sexual powers in diseases of central nervous system	499
Scarification in lupus vulgaris	291	Shaving-brushes, antilrax-infected, from Japan	257
Scarlatinal nephritis, malt coffee and sugar in	403	Shell-shock and crime	387
--- cystitis media	351	--- results of treatment in	385
Scarlatinaid eruptions	410	Shock due to burns	86
Scarlet fever	401	Shoulder-abduction splint, Todd's adjustable	553
--- appendicitis and	402	--- joint, dislocation of	535
--- convalescents' serum in	403	Sickness following prophylactic injection of diphtheria antitoxin	407
--- diagnosis test for	403	Silbersilvarsan in syphilis	448
--- and heart disease	402	Silver fluorescein in serofulous ophthalmia	199
--- malignant hemorrhagic	401	--- nitrite in chronic purulent otitis media	352
--- normal horse serum in	403	--- eczema of lip	170
--- respiratory complications of	402	--- irrigation for gonorrhoea in males	298
--- skin capillaries in	416	--- lotion in nasal dermatitis	111
--- streptococcus hemolyticus of	401	--- in ophthalmia neonatorum	122
--- surgical	402	--- or silver nucleinate for gonorrhoeal urethritis	296
Schaller's disease of tuberculosis of the tibia, x-ray diagnosis of	31	--- in thrush	428
Schoenmann clamp in fractures	526	--- trachoma	121
School medical service	403	Silvol for burns of eyelid	88
Schools, ringworm in	403	Sinus thrombosis, blood cultures in	158
Sciatica , hemi-sensory disturbances in	404	--- conservative surgery of lateral sinus	158
--- lactic acid in	2	--- gas-embolism of lateral sinus after mastoid operation	158
--- vaccineurine in	542	--- location of lateral sinus	158
Sclera, Dimitry's operation in eversion of	194	--- primary thrombosis of superior petrosal sinus	159
Sclerema, diagnosis of scleroderma	405	Skidgraphy in diagnosis of heart diseases	239
Scleroderma	405	Skin, action of pepsin on	10
--- paraffin-wax baths in	16	--- causes of	414
--- skin capillaries in	417	--- capillaries	416
Sclerosis, multiple	405	--- in children	417
Serofulous ophthalmia, silver fluorescein in	199	--- distast by Alpine sun lamps	416
Serophilus, colloidal sulphur in	10	--- in erythromelalgia	117
Scurvy in infants and adults	133	--- new microscope for observation of	410
--- metagen in	540	--- in polycthemia	416
--- treatment of	134	--- post-scabietic eczema	416
Sea-sickness , atropine in	406	--- psoriasis	416
Seasonal changes in skin disease	416	--- Raynaud's disease	417
Sebaceous gland secretion	412	--- Röntgen burns	416
Seborrhoea, antiseborrhoeic ointment in	407	--- scarlet fever	416
Seborrhoea , Castile soap with borax in	406	--- scleroderma	417
--- egg shampoo in	407	--- scleromyelia	417
--- precipitated sulphur and soap in	406	--- Werlhof's purpura	416
--- sulphur powder in	406	--- diseases, acidosis in	410
--- ultra-violet rays in	407	--- affections of mucosae associated with	407
Seborrhoeic sycosis (see Sycosis Barbae)	445	Skin diseases, general	407
Sedimentation cell, Eys's	551	--- seasonal changes in	416
--- process for detection of tubercle bacilli in sputum	428	--- vaccine therapy in	417
Seldel's sign in glaucoma	218	--- disinfectant, iodine as	13
Selenium in inoperable cancer	90	--- eruptions in diabetes	408
Senna and petroleum, confection of, as a laxative	539	--- ductless glands and	408
Sepsis, dental, in children	143	--- in Hodgkin's disease	408
Septicæmias, peptone injections in	19	--- hyperthyroidism	408
Serofibrinous pleuritis, x-ray diagnosis of	29	--- hypothyroidism	409
Serous spinal meningitis	310	--- as index to general disease	407
Serum, antigonococcal, in gonococcal arthritis	229	--- in leukemia	408
--- antimeningococcal, in tuberculous meningitis	312	--- precancerous dermatoses	408
--- blood, in hemophilia	234	--- scarlatina	110
--- convalescents', in measles	307	--- syphilis	407
--- scarlet fever	103	--- erythema multiforme eruptions of, value in detecting systemic diseases	408
--- homologous, in treatment of pneumonia, type I	366	Skin, general therapeutics of	417
--- of horses in cachectic tuberculous children	403	--- idiopathic hemorrhagic sarcoma of	415
--- normal horse, in scarlet fever	403	--- a mirror to the system	408
--- potent polyvalent antistreptococci	20	--- neurotic excretions of	412
--- of rabbits in severe hemorrhage	20	--- sarcoid, tuberculosis of, types and remedies	413
--- Rodet's, in typhoid fever	185	--- flaps, Reverdin, technique for	419
--- salted gelatinized, injections in detachment of retina	199	Skin-grafting , freezing with ethyl chloride in	419
Serum sickness	407	Skull, gummatous osteitis of, surgical treatment of	123
--- proteol injections in	19	--- surgery of (see Ciamal Surgery)	123
--- test, new, for syphilis	147	Sleeping sickness (see Trypanosomiasis)	473
--- therapy (see also Protein Therapy)	20	--- trypanosoma rhodesiense type of	473
--- in cerebrospinal fever	104		
--- in influenza and eye affection	201		
--- influenza bronchopneumonia	265		
--- mastoiditis	302		

	PAGE		PAGE
Shiner's neuralgia	313	Spine, tuberculosis of, treatment of	531
Small-pox (<i>see also</i> Vaccination)	420	Spirit installations in otomycoosis	163
— Paul's test in diagnosis of	420	Spirochaeta icterohæmorrhagica in infective	
— potassium permanganate in	420	jaundice	271
— soamin in trypanosomiasis	473	— pallida, neurotropic strain of	155
Soap, liquid ethereal, in ringworm of scalp	400	Spirochaetosis, bronchial (<i>see</i> Bronchial Spiro-	
— powder, lavettes	510	chaetosis)	83
Soaps, antiseptic value of	209	Spleen, movable large, of malaria, splenec-	
Soapsuds eczema in gastric ulcer	209	tomy for	299
Societies, medical and scientific	591	Spleen, tuberculosis of	180
Sodium acid phosphate in urinary diseases of		Splenectomy in rats	11
central nervous system	499	Splenic anæmia, units concerned in	80
— antimonyl tartrate in filariasis	203	Splint for Colles's fracture, Todd's	552
— bicarbonate and bromide in infantile		— Todd's adjustable shoulder-abduction	553
vomiting	254	Spoon for collection of faeces	553
— — in chorea	116	Sporotrichosis resembled by nocardiosis	112
— — protective action of, in chloroform		Sprue	128
anæsthesia	51	— autogenous oral streptococcal vaccines in	128
— bromide in enema for gastric ulcer	210	— meat diet in	128
— eucodylate in cataract	93	— and monilia psilosis	128
— — and hyposulphite in eczema	417	Sputum, albumin reaction in, and pulmonary	
— — — furunculosis	117	tuberculosis	128, 175
— — — — urticaria	417	Sputum, examination of	128
— citrate and emulsion magnesio in gastric		— — for tubercle bacilli, sedimentation	
ulcer	211	process for	128
— — in pneumonia	366	Stainless steel instruments	519
— — — typhus fever	488	Stalagmometer for study of urine	107
— hydnocarpate and sodium morphinate in		Stand and clamp for urethral dilator	553
leprosy	287, 288	Staphylococci in nephritis	531
— iodide and calcium chloride bath in		Staphylococcal infections of children, auto-	
cataract	200	genous vaccines in	117
— N-phenylglycineamide-p-arsonic acid in		— — — lower extremities, potassium per-	
trypanosomiasis	173	manganate in	17
— salicylate and bicarbonate for dengue	143	Steatorrhœa in disease of pancreas	351
— sorbate in leprosy	287	Stenosis of external auditory meatus	163
— thiocyanate in cataract	93	Stercobilin, amount of in faeces	202
Solar keratoses and cancer	415	Stereo-radiography of mastoid	300
Sore throat, iodine in	13	Sterilization	129
— yeldt	510	sterilizer, 'Brawoodline' automatic-lighting	
Sound, Watson's urethral dilator	551	gas-burner for heating	553
Soya bean oil in leprosy	287	Stibanyl in trypanosomiasis	173
Spas, British	586	Stethoscope, Alder's telescopic	551
Spasmalgia for spastic contractions	512	— bi-aural, Marr's	516
Spasmophilia	121	Stiff joints, treatment of	535
— belladonna in	122	Stomach, angiodia, of, sleeve resection	129, 130
— bland diet in	422	— carcinoma of	131
— bromides in	422	— — — operations for	132, 133
— calcium bromide in	422	— contents, analysis of (<i>see</i> Gastric Analysis)	206
— chloral hydrate per rectum in	422	— diagnosis of nervous disorders of, by	
— chloroform inhalation in	423	x rays	27
— cod-liver oil in	423	— hour-glass	112
— magnesium sulphate in	423	— models of, as found by x rays	27
— milk and cod-liver oil in	422	— polyp of, x-ray examinations in	27
— phosphorus in	422	— sarcoma of	130
Speculum, urethral	556	— simple tumours of	129
Spermatic cord, acute encysted hydrocele of	459	Stomach, surgery of	129
— torsion of	459	— — — chronic gastric ulcer	110, 111
Sphenoidal empyema and epidemic cerebro-		— — — (duodenal ulcer)	112, 113
spinal fever	332	— — — gastrojejunostomy	137, 138
— sinus, empyema of, and cerebrospinal		— — — jejunal and gastrojejunal anas-	
fever	101	tomy	138, 139, 140
Sphenopalatine (Meckel's) ganglion, neural-		— — — in phlegmonous gastritis	431
gia accredited to	313	— tuberculosis of, x-ray examinations in	28
Sphincters, rectal and urethral, in diseases of		— ulcer of (<i>see also</i> Gastric and Duodenal	
central nervous system	199	Ulcæ; Stomach, Surgery of)	
Sphygmomanometer, the 'Barton'	552	— — — x-ray examination of	25
Spinal anæsthesia	51	— — — volvulus of	431
— cord division by gunshot wound, condition		— — — x-ray examinations of, in tetanus	27
nervæ after injury	127	Streptococcal infection, potent polyvalent	
Spinal cord, gunshot wounds of	122	anti-streptococcal serum in	20
— — — injuries	126	— vaccines, autogenous oral, in sprue	128
— — — tumours causing injury to	123	Streptococci in nephritis	531
Spinal surgery	123, 124	Streptococcus hæmolyticus of scarlet fever	101
— — — anæsthesia in	49	— — — in tonsillar crypts	171
— — — injuries to great occipital and sub-		Stricture of rectum (non-malignant)	391
occipital nerves	426	— — — ureter	493
— — — vertebral artery	426	— — — urethra	493
— — — operative results and technique	124	Stropharia in heart failure	212
— — — symptoms and signs of atlas fracture	125	Subacidity, biters in	6
— tumours	123	Subarachnoid injection of anti-epilep-	1

	PAGE		PAGE
Subclavian aneurysm treated by distal ligation	509	Syphilis, sulfarsenol in	448
Sugar in blood	72	— and tabs	453
Sugar-free vegetables in diabetes mellitus	150	— toxic effects of arsenobenzol remedies in	448
Suggestion (see Psychological Medicine)		— treatment in	448
— in psychopathology	379	— of vulva (see Vulva)	512
Sulfarsenol in gonococcal arthritis and		— Wassermann test for	445
epididymitis	230	Syphilitic eruptions of skin	407
— syphilis	419	— iritis, aspirin in	200
Sulphate of soda, hypertonic solution of, for		— newborn children, caly injections in	157
trachoma	122	— — mercury injections and procy	457
Sulphur (colloidal)	542	— powder in	103
— injections in psoriasis	373	— papules in right external meatus	103
— and oil of cade in psoriasis of scalp	373	— patients, acute otitis media in	351
— ointment in ringworm	404	— sycoosis (see Sycoosis Barbae)	445
— powder in seborrhoea	406	— and tuberculous joints	536
— precipitated, and soap in seborrhoea	406	— virus, plurality of strains of	455
— and zinc ointment for stenosis of external		Syphiloma of the bladder	67
auditory meatus	163	vulvae	512
Suppuration after cataract extraction	96	Syringe, aseptic urethral	537
Suppuration, local, new technique for		— Harrison's, with Rundle's intravenous	555
treatment of warm abscesses	141	— needle	555
— in urinary passages in children	113	— hypodermic, the 'Luo'	555
Suppurative parotitis	360	— Mills' aspirating, for buboes	545
Surgical appliances	543	— Picken's urethral	557
— instrument case, Evans'	554	— urethral anæsthetic	556
— scarlet fever	402	Syngomyelia, skin capillaries in	417
Suture-carrying forceps	550		
Sweating of feet, excessive, alum		T ABES dorsalis (see Syphilis of Central	453
and talc in	441	Nervous System)	453
Sycoosis barbae	445	Talc and alum in excessive sweating of feet	441
— borio-starch poultices in	445	Tapeworm larvae occurring in the eye	197
— calamine soothing lotion in	445	— origin of cases of chorea	115
— epilation in	445	Tartar emetic in asthmatic attacks	82
— mercury cyanide in	445	— bilharziasis	65
— x-ray treatment in	445	— filariasis	203
Symphathectomy, peri-arterial, in causalgia	97	— trypanosomiasis	473
Symptomatology, cerebellar, and localisation	98	— injections for Delhi boil	139
Syncope of anaesthesia, resuscitation in	53	— — granuloma venerum	232
Syndrome, concussion, in prognosis of head		Teeth, septic, in children (see Dental Sepsis	118
injuries	126	in Children)	118
— geniculate ganglion	213	Testicles, diseases of.	458
— polynuritic, acute infectious enteritis	181	— abnormalities of position	461
with a	155	— acute encysted hydrocele of sper-	459
Syudromes, pluriglandular	445	matic cord	459
Syphilis	538	— — chlorio-epithelioma of	459
— argulan in	538	— epididymitis	460
— arseno-argenticum in	448	— torsion of spermatic cord	459
— arsenphenamin in	4	— varicocele	460
Syphilis, cardiovascular (see also		— — vesiculae seminales, persistent gono-	462
Aneurysm)	452	coccal infection in	462
— neosalvarsan in	453	— — thorium injection of	461
— of central nervous system	453	— Investigation of, in 100 deaths of all ages	458
— — — and lumbar puncture	454	— operations for partly-descended	461
— — — mercurial treatment in	453	Tetanus, x-ray examinations of stomach in	27
— — — neosalvarsan in	453	Tetraglandin palatinoids in neurasthenia	512
— — — novarsenobenzol in	453	Therapeutics, dictionary of	1
— — — and plurality of strains of		Thoracic surgery, anaesthesia in	52
syphilitic virus	455	Thoracoplasty in pulmonary tuberculo-	179
— and general paresis	451	Thorax, surgery of	162
Syphilis, inherited	456	— abscess	162
— and arsenical treatment of syphilitic		— — of lung and bronchiectasis	167
pregnant women	457	— acute purulent pleurisy	461
— congenital atrophy due to	457	— empyema	463
— luetin test for	456	— immediate closure of empyemata	461
— mercury lactate in habitual vomiting		— x-ray diagnosis of	29
of	457	Throat and nose operations, anaesthesia in	19
— neo-arsphenamin in congenital atrophy		— — local anaesthesia in	319
due to	157	Thrombophlebitis following influenza	262
— Wassermann test for	456	Thrush	468
— lutramine in treatment of	450	— boracic acid in	468
— jaundice in arsenobenzol treatment of	450, 451, 452	— silver nitrate in	468
— mental troubles of	323	— washing out stomach with alkaline	168
new arsenobenzol remedies in	448	mineral water in	168
— serum test for	447	Thymol as antiseptic in intestinal torania	228
— Sachs-Georgi serum reaction for	446	Thymus enlargement and nump	36
— silbersalvarsan in	448	— glands, enlarged, radium in	155
— of sixth and eighth cranial nerves (see		Thyroid gland, clinical pathology of	21
Bar, Inner)	161	— iodine content of	261
		— involvement in influenza	261

	PAGE		PAGE
Thyroid operation, anaesthesia in ..	49	Trigeminal neuralgia (<i>see</i> Neuralgia, Trigeminal)	313
Tibia and fibula, fractures of: treatment by plating operations ..	522	Trigone in diseases of central nervous system ..	199
The convulsif, painful ..	311	Trimine for gonorrhoea in males ..	228
Tick fever ..	468	Trypanlavine for gonorrhoea in males ..	228
Tune switch for x-ray exposures, the 'Ultima' ..	555	Trypanosomiasis ..	173
Tinctura hyoscyami, sodii bromidum, and liquor potassii citricis for gonorrhoea in women ..	226	— antimony oxide in ..	473
Tinea imbricata, resorcin and tinct. benzoin. co. in ..	201	— arsenheamin in ..	4
— syccosis (<i>see</i> Syccosis Barbae) ..	415	— atoxyl in ..	473
Thinitis and deafness, diathermy and radium in ..	166	— Chagas' disease ..	473
Thistles, cleavage products from ..	8	— salvarsanized serum in ..	473
Tone limits in children and adults ..	165	— soamin in ..	473
Tongue, cancer of (<i>see also</i> Cancer) ..	469	— sodium N-phenylglycineamide-p-arsonic acid in ..	173
— — — and invasion of lymphatic glands ..	469	— stibetyl in ..	473
— — — pituitary extract in ..	469	— tartar emetic in ..	473
— forceps, Corbould's ..	548	— T. gambiense type of ..	173
— sign in typhus fever ..	486	Tubercle bacilli in tissues , process for isolating ..	474
Tonic, tulin as a ..	21	— — — effect of ether on ..	50
Tonsil bayonet for abscesses, Scott Gillett ..	556	Tuberculides in recognition of obscure tuberculosis ..	177
Tonsillar crypts, streptococcus hemolyticus in ..	471	Tuberculin, indications for employment in eye lesions ..	200
Tonsillitis and mastoiditis ..	302	— in lupus ..	292, 293
Tonsils, control of hemorrhage after removal of ..	170	— old, in sarcoid tuberculosis of skin ..	113
Tonsils, diseases of ..	470	— tests and pulmonary tuberculosis ..	475
— — — nasal drill in ..	470	Tuberculosis of anus ..	56
— enlarged, and adenoids, infectious character of ..	470	— erythema nodosum and ..	191
— in relation to infectious processes ..	170	— index of sanatoria for ..	581
— removal of by the Sluder method ..	470	— of kidney ..	279
Torch, electric, for ear, throat, and nose examination ..	547	— larynx, prognostic importance of ..	477
Tor-ion of spermatic cord ..	159	— obscure, tuberculides in recognition of ..	177
Toxemia, intestinal (<i>see</i> Intestinal Toxemia) ..	265	— prevention up-to-date ..	258
Toxic effects of arsenobenzol remedies in syphilis ..	419	— proteals in ..	19
Toxine, action of colloidal metals on various ..	9	Tuberculosis, pulmonary (<i>see also</i> Influenza) ..	471
Toxin-antitoxin in diphtheria ..	153	— — — and the albumin reaction in sputum ..	175
Tuberculation in diseases of central nervous system ..	499	— — — artificial pneumothorax in ..	178
Tracheotomy ..	171	— — — etiological studies in ..	171
— low operation preferable to high ..	172	— — — and influenza ..	262
— tranquil, by injection of cocaine ..	171	— — — investigations re von Pirquet's test ..	176
Trachoma, argyrol for ..	121	— — — a new cutaneous reaction in ..	467
— brush treatment for ..	121	— — — night sweats in, epinephrin for ..	178
— carbon dioxide snow for ..	122	— — — pregnancy in ..	471
— hypertonic solution of sulphate of soda for ..	122	— — — thoracoplasty in ..	479
— iodine tincture for ..	122	— — — tuberculin tests and ..	476
— and zinc chloride in ..	198	— — — vaccination against ..	477
— magnesium sulphate for ..	122	— of skin, sarcoid ..	113
— mercuric cyanide injections for ..	122	Tuberculosis of spleen ..	480
— nepeta distillata ferment in ..	200	— — — stomach, x-ray examinations in ..	28
— oxidized naphthol-camphor for ..	122, 198	Tuberculous abscess ..	480
— perchloride of mercury for ..	121	— — — aspiration for ..	481
— protargol for ..	121	— — — hypertonic salt solution for ..	481
— protosil for ..	121	— — — children, cachectic, horse serum in ..	20
— silver nitrate for ..	121	— — — diseases of eye, krysolgan for ..	199
— zinc chloride and zinc sulphate for ..	122	— — — meningitis ..	312
Trades directory, medical ..	597	— — — sputum, albumin test for ..	428
Transfusion of blood in circulatory collapse ..	21	— — — sedimentation process for ..	428
Transplantation of kidney ..	277	— — — and syphilitic joints ..	536
— — — portion of scalp furnished with hair in alopecia ..	43	Tumours of antrum, malignant, treatment of ..	333
Traumatic aneurysm of right pulmonary artery ..	509	— — — bladder ..	68
Treatment, dictionary of ..	40	— — — causing injury to spinal cord ..	123
Tremor, anæsthetic ..	53	— — — cerebral ..	99
Trench fever (<i>see also</i> War Nephritis) ..	472	— — — of the eighth nerve in ear disease ..	166
— — — bacteriology of ..	472	— — — and neuralgias ..	311
— — — importance of de-lousing troops ..	473	— — — of pancreas ..	356
— — — and war nephritis ..	337	— — — paraneuphritic ..	282
Trichloroacetic acid injections in bladder-growths ..	69	— — — radium and x-rays in treatment of ..	37
		— renal ..	282
		— spinal ..	423
		— of stomach, simple ..	429
		— — — the vitreous ..	197
		Tungsten light in lupus vulgaris ..	291
		Turpentine injection, fixation abscess by, in influenza ..	264
		— — — to produce local abscess in cephalic lethargia ..	181

	PAGE		PAGE
Turpo-empysem as embrocation	512	Ureteral and renal calculi	280, 190
Tutin in asthma	21	— — — — diuretic waters for	190
— as a cardiac and general tonic	21	— — — — papaverine sulphate injection	190
— — — — diuretic	21	— — — — — for	190
— effect on blood-pressure	21	— — — — — paraline for	190
— as a purgative	21	Urethritis	278
Typhoid 'carrier' as a danger	250	Urethra, diseases of	192
— cholecystitis	483	— diverticula of	193
Typhoid fever (<i>see also</i> Infections		— stricture of	193
Diseases Prevention; Paratyphoid		— Watson's dilating sounds for	551
Fever	482	Urethral anasthetic syringe	556
acute intussusception in	483	— dilator, stand and clamp for	553
associated with paratyphoid infection	484	— irrigator and irrigating nozzles, Cammy	519
bacteriology of	482	Ryall's	
carriers, surgical treatment of	486	nozzle, Harrison's, for introduction of	550
ear disease in	161	ointments	556
etiology and symptoms	482	speculum	557
laundry's paralysis in	181	syringe, aseptic glass	557
lip discoloration in	185	— Picken's	557
meningeal manifestations in	181	Urethritis	192
in old age	483	gonorrheal, silver nitrate or silver	
prophylactic inoculation in	181	unclean for	226
Rodel's serum in	185	Uric acid in blood	72
vaccine in	485	— power of kidneys to concentrate	276
Typhus fever	486	Urinary antiseptic, mercuriodirome-220 as a	15
camphor oil in	188	disease, vaccines in	22
in children	486	disorders in children	113
diagnosis in	187	passages in children, suppuration in	115
epidemiology and symptoms in	186	symptoms in diseases of central nervous	
loss of knee-jerk an important dia-		system	198
gnostic symptom	487	— tract, anesthesia in surgery of	70
meningeal reaction in	187	— purpura of	70
normal saline in	188	Urine, bacteriological examination	198
optic neuritis in	487	Urine, clinical pathology of	191
parotitis complicating	487	cytological examination	497
peptone injection in	488	in diseases of central nervous system	499
sodium citrate in	488	physical examination	497
tongue sign in	486	Rosenbloom's urinometer for study of	497
Well-Felix reaction in	487	stalagmometer for study of	495
		tests directed to some special object	496
		— for acetone bodies	496
		— albumin	496
		— ammonia-nitrogen	496
		— chlorides	497
		— glucose	496
		— organic acids	496
		— urobilin	496
		Urinometer, a flat	557
		Urological findings in diseases	
		of central nervous system	498
		Urotropine injection in infective jaundice	272
		Urticaria, cacodylate and hyposulphite of	
		soda in	117
		Uterine colic, benzyl benzoate in	6
		fibroids, x-ray treatment of	51
		Uterus, bleeding of, functional	500
		— radium in	501
		cancer of, radical operation	501
		— radium in	501
		Uterus, disorders of	500
		cauterage in	502
		hysterectomy: the artery of the round	503
		ligament	
		myoma of, radium in	501
		V ACCINATION against pulmonary tuber-	
		culosis	477
		Vaccination, age for	506
		stations, educational	593
		— and B.I.P.P. in cold sore	510
		Vaccine, antitubercular (St. Mary's Hos-	
		pital)	538
		'B', mixed acne (St. Mary's Hospital)	510
		diphtheria bacillus (St. Mary's Hos-	
		pital) in treatment of 'carriers'	539
		mixed gonorrhoea (St. Mary's Hos-	541
		Vaccines in acne vulgaris	537
		antityphoid, in gonococcal complications	229
		in arthritis deformans	22
Turpo-empysem as embrocation	512		
Tutin in asthma	21		
— as a cardiac and general tonic	21		
— — — — diuretic	21		
— effect on blood-pressure	21		
— as a purgative	21		
Typhoid 'carrier' as a danger	250		
— cholecystitis	483		
Typhoid fever (<i>see also</i> Infections			
Diseases Prevention; Paratyphoid			
Fever	482		
acute intussusception in	483		
associated with paratyphoid infection	484		
bacteriology of	482		
carriers, surgical treatment of	486		
ear disease in	161		
etiology and symptoms	482		
laundry's paralysis in	181		
lip discoloration in	185		
meningeal manifestations in	181		
in old age	483		
prophylactic inoculation in	181		
Rodel's serum in	185		
vaccine in	485		
Typhus fever	486		
camphor oil in	188		
in children	486		
diagnosis in	187		
epidemiology and symptoms in	186		
loss of knee-jerk an important dia-			
gnostic symptom	487		
meningeal reaction in	187		
normal saline in	188		
optic neuritis in	487		
parotitis complicating	487		
peptone injection in	488		
sodium citrate in	488		
tongue sign in	486		
Well-Felix reaction in	487		
ULCERS , atonic, iodine in	13		
— chronic gastric	410, 411		
— healing after gastrojejunostomy	420		
— duodenal	412, 443		
— gastric and duodenal	209		
— with hypopyon, iodine in	13		
— jejunal and gastrojejunal,	138, 139, 440		
— lymphatic, iodine in	13		
— quartz lamps in	418		
— rodent	400		
— varicose, physiological methods in treat-	508		
ing			
Ulcers of Leg (<i>see also</i> Skin, General			
Therapeutics of; Vascular Surgery)	488		
— — — — Barrow's solution in	488		
— — — — plaster for	488		
— — — — Unna's paste in	488		
— — — — Unna and radius, fractures of	522		
— — — — Ultra-violet rays and control of dosage	59		
— — — — in catarrhes	93		
— — — — scleroderma	107		
— — — — Undillies, diphtheria of the	152		
— — — — Ucinariasis, oil of chenopodium in	7		
— — — — Unguentum hydragryi oxidi flavi in eczema	169		
— — — — of lip	488		
— — — — Unna's paste in ulcer of leg	335		
— — — — Uremia and nephritis	199		
— — — — in diseases of central nervous system	275		
— — — — Urea concentration test	71		
— — — — nitrogen of blood	489		
Ureter, surgery of (<i>see also</i> Kidney,			
Surgery of)	492		
— — — — dilatation of vesical end	489		
— — — — experimental ligature, and the results	492		
— — — — following	492		
— — — — papilloma	492		
— — — — stricture	492		
— — — — Ureteral anastomosis	491		
— — — — colic, benzyl benzoate in	6		

	PAGE		PAGE
Vaccines in bronchial asthma ..	22, 60, 62	Visceroptosis (<i>see</i> 'Colon, Mobile) ..	119
-- bacillary dysentery ..	137	Vision, loss of, due to nasal accessory	
-- cerebrospinal fever ..	105	sinuses ..	332
-- chilblains ..	22	Vitamin diet in deficiency diseases ..	512
-- chronic bronchitis ..	22	Vitreous, cysticercus of the ..	197
-- gonorrhoea ..	22	-- tumours of the ..	197
-- eczema with intestinal dyspepsia	418	Vocal cords, malignant tumours of, causing	
-- colon bacillus pyelitis ..	22	impairment of mobility ..	285
-- cystitis ..	22	Volvulus of stomach ..	431
-- diphtheria ..	154	Vomiting, habitual, and inherited syphilis,	
-- erysipelas ..	418	mercury lactate in ..	157
-- fibrositis ..	22	-- in infants ..	254
-- furunculosis ..	22, 201, 418	-- infantile diarrhoea and ..	253
-- gonorrhoeal, in keratoderma blennor-		-- of pregnancy, placenta substance tablets	
rhagica ..	418	in ..	511
-- in gonorrhoea in males ..	228, 229	Von Pirquet's test, investigations concerning	176
-- -- women ..	225	Valva, diseases of ..	512
-- gonorrhoeal complications ..	230	-- kraurosis of ..	512
-- rheumatism ..	22	-- syphiloma of ..	512
-- gynaecological disease ..	22	Vulvovaginitis, chronic, of children, Dakin's	
-- influenza ..	264	oil for ..	228
-- influenza bronchopneumonia or			
pneumonia ..	265		
-- intestinal toxæmia ..	266		
-- localized abscesses ..	22		
-- muscular rheumatism ..	20		
-- nephritis ..	335		
-- ocular therapeutics ..	202		
-- oral streptococcal, in sprue ..	428		
-- in panophthalmitis due to B. coli	198		
-- primary neuritis ..	22		
-- skin diseases ..	417		
-- staphylococcal infections of children	417		
-- streptococcal, in bulbous impetigo	418		
-- in typhoid fever ..	485		
-- urinary disease ..	22		
Vaccineurine in neuralgia, neuritis, and			
sciatika ..	512		
Vagina, diphtheria of the ..	152		
Varicella ..	506		
-- accidental rashes in the form of erythema			
in ..	507		
-- and herpes ..	507		
-- retinitis complication in ..	507		
-- due varicella ..	507		
Varicocele ..	460		
Varicose ulcers, physiological methods in			
treating ..	508		
-- veins ..	507		
Vascular surgery ..	507		
Vegetable diet in diabetes mellitus ..	118		
Veins, danger of entrance of air into	509		
-- varicose ..	507		
Veldt sore ..	510		
-- antitoxin in ..	510		
-- B.I.P.P. and vaccine in ..	510		
-- sores analogous to ..	510		
Venesection in eclampsia ..	368		
Ventilation as a science ..	389		
Ventricles, fibrillating, massage of ..	53		
Ventriculography, localization of cerebral			
tumours by ..	99		
Vertigo (<i>see also</i> Ear, Inner) ..	511		
-- adrenalin in ..	166, 511		
-- and errors of refraction ..	511		
-- unilateral Eustachian inefficiency ..	511		
-- vestibular, of non-suppurative origin	165		
Verumontanum and internal sphincter in			
diseases of central nervous system ..	199		
Vesical calculus ..	67		
-- spasm, benzyl benzoate in ..	6		
Vesicles and prostate in diseases of central			
nervous system ..	499		
Vesicles seminales, method of thorium in-			
jection ..	461		
Vestibular hysteria ..	165		
-- vertigo of non-suppurative origin	165		
Viability of intestine, test for ..	269		
Vincent's angina, ar-phænium in ..	4		
-- disease ..	411		
WAR injuries, radium in conditions super-			
vening upon ..	35		
-- nephritis ..	336, 337		
Warts, plantar, x-ray treatment results (<i>see</i>			
also Skin, General Therapeutics of) ..	513		
-- radium in ..	418		
Wassermann reaction of cerebrospinal fluid	106		
-- test for inherited syphilis ..	456, 458		
-- -- syphilis ..	415, 451		
Weighing machine with mirror ..	557		
Werthof's purpura, skin capillaries in ..	416		
White precipitate ointment in ringworm ..	401		
Whooping-cough, benzyl benzoate in ..	513		
-- ether injections in ..	511		
Worms, chenopodium in treatment of ..	7		
Wound diphtheria ..	152		
Wounds of bones and soft tissue, chronic			
infected, immediate sterilization and			
closure of ..	533		
-- gentian violet for ..	11		
-- gunshot, of spinal cord ..	122		
-- septic war, ionization in ..	38		
XANTHOMA as indication of diabetes ..	409		
Xeroderma pigmentosum, benign			
cystic epithelioma with ..	191		
Xerophthalmia, chlorodyne in liquid paraffin			
for ..	122		
X disease ..	367		
X-ray appearances of bones ..	30		
-- burns ..	25		
-- effect on skin capillaries ..	116		
X-ray diagnosis --			
-- abnormality of patella ..	31		
-- congenital narrowness of the pyloric			
orifice ..	26		
-- diaphragmatic hernia ..	27		
-- foreign bodies in the heart and vessels	30		
-- gall-stones ..	28		
-- gastric and duodenal ulcer ..	25		
-- influenza pneumonia ..	29		
-- Köhler's disease of scaphoid bones of			
the foot ..	31		
-- Legg's disease ..	31		
-- metastatic malignancy of bones ..	32		
-- multiple exostoses ..	31		
-- myxochondrosarcoma of femur ..	32		
-- nervous disorders of stomach and			
intestine ..	27		
-- non-opaque foreign bodies in the			
bronchi ..	29		
-- ossification in bones of hands ..	31		
-- pericarditis with effusion ..	30		
-- renal tuberculosis ..	279		
-- Schläpfer's disease of tuberosity of			
the tibia ..	31		

	PAGE		PAGE
X-ray diagnosis— <i>continued</i> .		X-ray treatment— <i>continued</i> .	
--- serofibrinous pleuritis	29	--- pituitary tumours	102
--- thorax	29	--- plantar warts	513
--- tuberculosis of stomach	28	--- polycythaemia	35
--- ulcerative tuberculous colitis	28	--- pruritus ani	36
X-ray examination—		--- psoriasis	373
--- appendix	28	--- ringworm	101
--- congenital narrowness of pyloric orifice	26	--- syphilis barbae	115
--- to determine operability of cancer of stomach	27	--- tubercle of anus	56
--- digestive tract	26	--- tumours	37
--- duodenum	25	--- uterine fibroids	31
--- polyp of stomach	27	--- work, dangers of	25
--- to show size of heart	30	X-rays (<i>see also</i> Radiotherapy)	
--- stomach	25	--- erythema dose of, in favus	202
--- in tetanus	27	--- as immunity-raising agent before and after operations for cancer	37
--- exposures, the 'Ultima' time switch for findings, models of stomach as shown by	555	--- rarities of	32
--- findings, models of stomach as shown by	27		
X-ray treatment		Y AWS, arsenobenzol in	515
--- acne vulgaris	36, 12	--- arsenamin in	1
--- acromegaly	36	--- neosalvarsan in	515
--- cancer	89	--- novarsenobillon in	515
--- of external ear	162	Yellow fever	515
--- cerebral tumours	101	--- and infectious jaundice	515
--- Delhi boil	139	--- and leptospira icteroides and <i>L. ictero-haemorrhagica</i>	515
--- dysmenorrhoea	31		
--- goitre	22		
--- exophthalmic	37		
--- granuloma venereum	232		
--- idiopathic haemorrhagic sarcoma of skin	515	Z INC carbonate in furunculosis	201
--- inoperable sarcoma	36	--- chloride in chancre	109
--- lupus vulgaris	291	--- and iodine in trachoma	198
--- lymphosarcoma and Hodgkin's disease	294	--- zinc sulphate for trachoma	122
--- menorrhagia	34	--- and sulphur ointment for stenosis of external auditory meatus	163
--- neoplasms	36	Zoster: post-zoster neuralgias	341
--- oriental sore	35, 274	--- zone of the geniculate ganglion, Hunt's	213

Introduction.

A REVIEW OF THE YEAR'S WORK.

BY THE EDITOR.

Our thirty-ninth annual volume gives evidence of the energy with which all branches of the profession have been working during the past year. Much has been added to our knowledge, and those responsible for the various sections of the book have all striven to make it available to our readers.

Owing to delay in transmission we have been obliged to print the valuable and interesting article on *Orthopædic Surgery*, by Drs. Fred H. Albee and R. F. Carter, of New York, at the end of the New Treatment section.

Under present conditions the subject of *Public Health* has become the concern of every practitioner, and we have thought it desirable to bring Dr. Priestley's articles into the body of the work instead of making them a separate section as formerly. With so much legislative and administrative work on this subject, we are fortunate to have an exponent who can place complex details before us with so much lucidity.

Dr. O. C. Gruner's article on *Bacterial Life Cycles* will be read with much interest. While it is supposed that bacteria only multiply by fission, many phenomena in connection with infectious diseases must remain anomalous. The objection to the theory of immutability of bacterial types is fully discussed, and the considerations advanced will help us to interpret some features concerning influenza, pernicious anæmia, and Hodgkin's disease which are at present inexplicable.

Another very valuable article by the same writer has the title *Blood, Cytology of*, and contains a report of the investigations of Pappenheim and others which may change our whole outlook upon the etiology of inflammation, abscess, all kinds of splenomegaly, and some diseases of the glands and liver. The blood-cells themselves change their character in accordance with definite laws; they have their periods of infancy, childhood, youth, and maturity. They are not persistently in the blood-stream, but pass to and fro to the tissues, and each has within it certain factors which determine its future. The fixed cells are not unchangingly fixed. They sometimes become floating also. It is becoming clear that the capillary system is composed of units which are not always mere endothelial cells lining the wall of a vessel. According to this conception we find that even the minute vascular system is in a state of flux, the duration of any particular cell being itself variable. Hematology,

like all sciences, is one which changes because conceptions change, and this last includes one of the most important points which have yet appeared on the field of thought. The article is illustrated by diagrams which, together with the writer's lucid explanations, will help to make these new ideas clear to our readers.

It is remarkable that *Cerebrospinal Fever* does not occur with greater frequency, because it is calculated that 2 to 10 per cent of the civilian population are meningococcus carriers, and that an overwhelming majority of the population are exposed to infection within the course of a year. The most powerful influence in eliminating the meningococcus in the chronic carrier is a 'cold in the head'; another method by which he becomes free from infection is the invasion of the 'site of the carrying' by some other bacterium. Those are happiest who know nothing about what is taking place in their upper air-passages! It is important to observe that meningococcal infection can set up attacks of acute rheumatism, and rheumatic fever may be very prevalent during an epidemic.

There has always been a doubt whether the discovery of the diphtheria bacillus invariably pointed to a bacillus capable of producing infection. We have the bacillus of the true infectious character which appears during epidemics, and also one that is apparently identical which we may find in sporadic cases, or in the air-passages of those who have no symptoms of disease. Recently a method has been devised by which the true diphtheria bacilli can be differentiated from the morphologically similar organisms. The method is described in the article *Diphtheria*. The point of importance to the medical practitioner is that the existence of diphtheria bacilli in a patient having none of the clinical symptoms of diphtheria does not justify the diagnosis that the patient is suffering from an infectious disease unless evidence is afforded that the bacillus discovered is the genuine article. During the war, the average time for detention in hospital of diphtheria patients was 45 days, 20 of which were occupied in procuring information regarding the absence of bacilli from the throat.

Scarlet Fever is one of those fevers which usually run a natural course and terminate favourably. When we hear of 182 cases being treated with convalescents' serum or normal horse serum, the dose being 50 c.c. for children and 100 c.c. for adults, and that apart from collapse no bad effects were observed, we begin to wonder whether there was any sufficient reason for placing patients in the position to suffer from 'bad effects' of treatment. Another observer who tried this treatment in 21 cases found that 'severe complications such as rigors and fatal collapse might occur'.

Statistics in reference to the value of prophylactic inoculation against *Influenza* given by Sir Wm. Leishman go to show that it was of great value when only one dose of the vaccine was given, and also that it greatly diminished the cases of pneumonia in those who were subsequently attacked. The formula of the vaccine now employed in the

Army and also by the Ministry of Health has been increased from 60 million to 400 million as regards the *B. influenza*, with streptococci 80 million and pneumococci 200 million in one c.c. (article *Influenza*). Digitalis has proved very useful if given before the heart begins to fail.

A method of treating *Small-pox* has been put forward as superior to all others. The patient on admission to hospital has the whole body painted over with a saturated solution of permanganate of potash, and this is repeated in the same strength or a weaker one on the following days. It is claimed that the treatment shortens convalescence and reduces the subsequent scarring to a minimum.

In *Typhus Fever*, normal saline given by the rectum every four hours, commencing about the eighth day, appears to have given good results. Another observer used camphor oil (10 to 20 per cent solution), a teaspoonful being given every two to three hours according to the pulse.

The curability of *Cataract* by medical means has lately been discussed by oculists. The iodides have been tried and rather discredited, but hopes are entertained that good results may follow on the lines of immuno-therapy and the application of antigens and antibodies.

Observations have also been made with radium, the selectively acting gamma rays being utilized, and definite improvement is claimed in a large percentage of cases. Dionin in a 1 per cent solution, dropped into the eye three times a week, is spoken of favourably. One American observer claims good results from glycerin, boric acid, and water as a means of improving the condition of the lens. Others have relied upon prolonged mydriasis and use physostigmine salicylate twice daily. Dr. Burdon-Cooper's article upon cataract also mentions other modes of treatment, and he tells us that "while not wishing to be too severe on empirical methods, it must be admitted that the only rational basis of treatment is a sound pathology, and that this is where our knowledge comes short to-day in cataract generally". As Dr. Burdon-Cooper has been working at the chemical pathology of cataract for many years and much of our knowledge on the subject is due to his researches, great weight must be attached to his opinion. He found tyrosin and cholesterin in the lenses and aqueous of cataract patients, and was forced to the conclusion that senile cataract resulted from the hydrolysis of the lenticloprotein. It has been shown that in cataract there is great diminution in the potassium salts and great increase in the calcium, magnesium, and iodine salts. These facts should be considered in reference to the medicinal treatment of the condition.

In the article *Eye Affections, General Therapeutics of*, there is a suggestion for an eye-bath in cataract cases, to be used for twenty minutes daily. It consists of calcium chloride 4 grms., sodium iodide (dry) 4 grms., distilled water to 500 grms.

In the article *Conjunctiva*, Dr. Burdon-Cooper gives a useful hint respecting the use of perchloride of mercury as an antiseptic. He tells us that 1-20,000 is quite strong enough for general lavage, and that nothing stronger than 1-10,000 should be used. Boracic acid for eye

lotions has become such a routine prescription, that the practitioner should not forget the very great superiority of the perchloride in all cases where any septic condition exists or is suspected.

Another practical suggestion in the treatment of diseases of the conjunctiva and cornea is the use of magnesium sulphate 40 gr. to 1 oz. and upwards, as an eye-bath, applied for five minutes every two or three hours. Its effect is to induce osmosis and lymph-flow and to give great relief to the patient. In *ophthalmia neonatorum* it is now recognized that a 1 per cent solution of nitrate of silver is fully protective, and that stronger solutions should be avoided. As regards the use of the organic forms of silver—protargol, argyrol, etc.—they have come to be looked upon as merely palliative in eye affections generally (*Conjunctivitis*). In the article *Glaucoma*, a practical hint is given respecting the continued use of eserine. In order to prevent its tendency to set up irritation of the conjunctiva, it is suggested that 1 gr. of camphor should be incorporated with it. The strength of the solution is not stated.

In the article *Arterial Tension*, Dr. Carey Coombs tries to help us to understand the cause of the high tension found in some individuals who have no renal lesion. After discussing other observations, we are brought to the truth of the fact expressed by O'Hare that, in cases of vascular hypertension, mental and physical rest causes a marked drop in the pressure, while mental excitement provokes an even sharper rise. The technique of the method of measuring arterial tension is carefully considered in this article, and some important points are brought forward. In the treatment of this condition the advice to retire from business is generally bad. Patients with hypertension need something to think about. Walking exercise and golf are commended, with a mild restriction of diet (not especially as to proteins).

In the article *Heart Disease*, Dr. Carey Coombs devotes considerable space to the new methods of heart examination by electrocardiography and skiagraphy. Both methods are valuable from the physiological and pathological standpoint, but we should be in an unfortunate position if either were essential to exact diagnosis. We sometimes think that the family physician who makes use of the stethoscope and the finger comes to a better judgement because his observations are not exclusively confined to the heart and he considers it in relation to other functions of the body.

In actual practice, Dr. Carey Coombs tells us, it will be seldom necessary to use skiagraphy except for the discovery of lesions which, like aneurysm or pericardial effusion, cast an abnormal shadow, and occasionally to see whether the right heart is enlarged or not.

War experience has led us not to place too much reliance on murmurs without careful discrimination. Conner says that fully nine-tenths of the apical systolic murmurs in young adults belong to the class of accidental or functional murmurs. But there are murmurs which always indicate organic disease, i.e., the presystolic murmur of mitral stenosis

and the diastolic murmur of aortic incompetence. The best way of hearing these sounds is fully considered and should be referred to.

The Universities of Cambridge, London, and Liverpool have instituted a diploma in *Radiology*, and have thus recognized the importance of this branch of study and the special requirements of those who practise it. Dr. Shillington Scales has been appointed Lecturer at Cambridge, and Mr. C. Thurstan Holland Lecturer at Liverpool.

The very great advantage of an *x*-ray examination as an aid to diagnosis has perhaps caused too great a reliance to be placed upon it, to the exclusion of physical methods. In fact the radiologist has been called upon to make the diagnosis. Watkins, in a recent article, makes a very proper protest against this practice. He says "that no such thing as a so-called *x*-ray diagnosis should be either demanded or expected; if the best use of an *x*-ray examination is to be made, then it should be looked upon as a consultative examination in which a full knowledge of the clinical history and symptoms is correlated with what is demonstrated by means of radiology". This point needs particular emphasis in respect to radiographs of joints. It is impossible to make an accurate examination of a joint unless it is examined in motion, whereas the radiograph can only show it at rest, and deposits of lithates, which may be extracapsular, may appear in the picture as outgrowths of bone. It is only by the combination of careful physical diagnosis with the *x*-ray picture that the true condition of the joint can be ascertained.

Septic conditions of the teeth as a cause of ill-health in children have been investigated by F. St. J. Steadman with results which deserve the attention of the profession (*Dental Sepsis*). These children look pale, tired, and sleepy. They lose weight, largely owing to loss of sleep. They suffer from gastro-intestinal disorders, and this appears to be due to the sepsis and not to defects of mastication. Dental sepsis as a cause of enlarged glands, tonsillitis, and otitis media should be recognized. Dr. Langmead, in reviewing this subject, lays emphasis on the advisability of removing all the necessary teeth at one sitting.

The fact that children very frequently suffer from pyelocystitis and suppurative nephritis is not recognized as frequently as it should be. High fever, remittent or irregularly intermittent, is one of the earliest symptoms. Milk with large quantities of water is recommended as the special diet in these cases. Epinephrin, hexamine, and autogenous vaccines have been used with good results. (*Children, Disorders of the Urinary System in.*)

Dr. Langmead has an article on the unexplained fevers which occur in childhood (*Children, Fever in*). Amongst other possible causes he reminds us that acute rheumatism quite possibly manifests itself outwardly only by pyrexia, with perhaps slight cardiac dilatation, which could easily be ascribed to the fever itself. Such cases occur with far greater frequency than is suspected, not only amongst children but in

adults. The idea that articular troubles are an essential symptom in rheumatic fever must be abandoned before this disease is understood. The important diagnostic point in these cases is the relation of the temperature to the pulse. If the pulse is slower than the temperature would warrant, it is a presumption in favour of the cause being 'rheumatic', and this will be strengthened if the reaction of the skin is found to be intensely acid. In such cases nothing but harm can result from the use of antipyretic remedies. H. Jumon very properly takes the view that many so-called obscure febrile and sub-febrile conditions for which a pathological cause is sought in vain, are really instances of purely physiological hyperthermia and not fever at all. He mentions that a walk of three miles will sometimes raise the temperature of a child to 100.2°. It does not appear to be recognized generally that active exercise invariably raises the body temperature if the patient is clothed. A medical friend who disputed this point with the writer confessed his error the next day. He had been mowing his lawn with a thermometer in his mouth!

In Dr. J. S. Fraser's article, *Otitis Media*, another cause of fever in children, frequently overlooked, is mentioned—suppuration of the middle ear. Fever, with crying, restlessness, sleeplessness, and boring the head into the pillow, should direct attention to aural suppuration as a possible cause.

The question has been raised as to whether chronic indigestion in children is not frequently due to fatigue. Over-work or over-play, over-excitement or too late hours—attention to these points in many cases will yield better results than careful dietary. But the taking of food between meals, and defective mastication, are also causes which should not be overlooked (*Children, Gastro-intestinal Disorders in.*)

In the article *Infantile Diarrhœa* some interesting results are recorded of the way in which this disorder became non-existent in a home for infants as a result of some simple hygienic precautions. These consisted in keeping the food free from infection by flies, the hands of the patients or nurses, or the soiled napkins and soiled nates of the patients. The article is worth referring to, as it shows what important results can be obtained by simple cleanliness.

The latest and by no means the least efficient remedy for *Whooping-cough* is the administration of 5 to 40 drops of a 20 per cent solution of benzyl benzoate, three or four times a day. It was found that when flavoured with a few drops of benzaldehyde, and administered in syrup or milk, it was better taken by children, and appeared to be more effective.

Some discussion has taken place on the protection of the perineum during labour. Dr. Fothergill (*Labour*) reminds us that the perineum is stretched when the legs are flexed on the abdomen, and is relaxed when they are extended. For the same reason a man's trousers "do not crack at the fork while he is standing but while he is squatting".

The injection of boiled salt water through the umbilical vein as a means of favouring the separation of the placenta has been revived. The water is used at a temperature of 50° to 60° C., and contains 15 to 20 per cent of salt and 2 per cent of citrate of sodium. It produces a complete swelling of the vascular system of the placenta, and therefore a swelling of the villi. This increases its bulk, and then, from contraction of the uterus, tends to reduce hæmorrhage.

Venesection has been revived for the treatment of eclampsia where the blood-pressure is high. Some 20 to 30 oz. of blood are taken at the first sitting, with a view to keeping the blood-pressure down to 120 mm. The bowel is washed out, or full doses of magnesium sulphate are administered.

Some interesting and important observations have been made on the use of radium in uterine bleeding and its effects upon the menopause. Dr. Fothergill's article (*Uterus*) should be consulted on this point. In the same article the question of curettage is fully considered, and also the value of radium in uterine cancer. It is said that radium has proved so useful in advanced and inoperable cancer of the cervix that the question arises whether it does not give better results than operative treatment in early and operable cases also.

Psychotherapy appears now to be accepted as a method of medical treatment, and clinics have been established at several medical schools. Instead of speaking of 'functional nervous disorders', we use the term psychoneuroses to express the condition, and this term is applied to describe "all diseases in which no organic basis can be detected by clinical methods". The view taken is that a psychoneurosis is never produced by a trauma later in life, but invariably dates back to a predisposing cause in childhood. Our attitude towards life which predisposes or otherwise to neurosis is determined in childhood. It is claimed that a patient does not inherit a symptom acquired by his parent, but one may inherit the predisposition, and symptoms are often acquired by the suggestion of the parent. All psychoneuroses are regarded as due to a failure in adaptation to life. The severity of the stress of life and the ability of the patient to bear the strain are the determining factors. Dr. J. A. Hadfield, in the article *Psychological Medicine*, explains very fully the treatment of these cases and its rationale.

Drs. Bedford Pierce and Marguerite Wilson have in the articles on *Mental Diseases* brought our knowledge of the subject up to date and show how much work of a high standard is being devoted to this question. Formerly the etiology of mental trouble was considered as almost wholly hereditary. To-day the influence of an infection or an intoxication, autogenous or exogenous, is admitted. The part played by syphilis in causation is no longer questioned. It is accepted that this infection can provoke attacks in which the mental symptoms are the direct product of the toxic action on the central nervous system.

Causalgia forms the subject of an interesting article by Dr. Ramsay Hunt. Patients with the condition are anxious, fearful, and crave isolation, and have a peculiar glossy skin as a secondary manifestation. This condition follows some wound lesion which may be quite superficial. Intraneural injections of 60 per cent alcohol have been used with some success.

It seems incredible that a brain tumour as large as one's fist can exist in either cerebral hemisphere and still escape localization by expert neurologists and neurological surgeons. Dr. Ramsay Hunt prefaces his article on *Cerebral Tumours* with this statement, and then proceeds to describe a method of ventriculography by which these tumours can be localized. This is a very important matter, since the only cure for a tumour of the brain is extirpation, and early localization is essential to success.

Epilepsy forms the subject of a very important article by the same writer, because it shows how greatly modern views have changed the classical conception of this disorder, and it is worth careful attention. As regards treatment, luminal in doses of $1\frac{1}{2}$ gr. at bedtime appears to have been used with success, but at the time of writing this drug appears to be unobtainable.

Discussion has taken place as to the ill results which sometimes follow alcohol injections for neuralgia (*Neuralgia*). Dr. Ramsay Hunt quotes Cushing, who considers that deep extracranial injections of alcohol into the maxillary and mandibular nerve-trunks near their foramina of exit from the skull have completely superseded peripheral neurectomies. In neuralgias limited to one of the two lower divisions, and which may possibly not extend into the other trigeminal areas, alcohol injections represent unquestionably the treatment of choice. He gives a number of clinical indications for treatment in these cases which are of great value, and which will be helpful in determining the line of treatment to be pursued. A new method of treating neuralgia of the head by bruising the painful points has been described. During the first few days this procedure is said to be 'quite painful'. Daily treatments are given for six days, followed by a rest interval of two or three days. It is difficult to see where this treatment is superior to simple friction over the painful points, which gives rapid relief in many cases.

The occurrence of cases of 'sleeping sickness' in this country will make Dr. Ramsay Hunt's article on *Encephalitis Lethargica*, in which the whole subject is very fully dealt with, of great interest to the profession. It is pointed out that although apathy, somnolence, stupor, or coma is usually a prominent symptom, some patients do not manifest it at all. A patient may be drowsy in the day-time but be sleepless and restless at night. There are, in fact, many varied types of the disease, all of which are fully considered in the article. Hexamine has been recommended to be given by the mouth in these cases, but the most important remedy appears to be the production of a local abscess by an injection of turpentine. From 16 to 32 min. of turpentine are injected into the outer side of the thigh, with the result that an abscess

requiring incision is usually formed. This treatment appears to act upon the lines which nature itself takes to eliminate toxic matter from the system. The use of arsenic and antimony is condemned in these cases.

Errors of refraction are a well-recognized cause of *Vertigo*, but attention has recently been called to Eustachian inefficiency as a cause of this disorder. As is well known, the Eustachian tubes are normally closed except during the act of swallowing, when they should open for the fraction of a second and close again like the shutter of a camera. It is when the tubes fail to open through some inefficiency that the regulating action fails. This prevents equalization of pressure on the drums, and giddiness and staggering may occur. It is important in these cases to treat the local catarrh and remove its cause, and train the patient to keep his Eustachian tubes free.

The treatment of chancroid is said to fail because of the depth at which the organism lies. In the article *Chancroid* the use of the high-frequency spark in conjunction with sulphate of copper is advocated as the best method. In the same article the treatment of unbroken bubo by injection of arsenate of soda is recommended. When pus has formed, it is first evacuated, and then the same injection is used combined with ether.

Recent efforts by the Ministry of Health to check the frequency of gonorrhœa have been only partially successful, mainly because patients treated at the public clinics do not continue long enough to be completely cured, so that they remain carriers of infection. On the other hand, the tests demanded by the Ministry of Health as a standard of complete cure are very severe, and would probably be resented by the patient. They would also require a large amount of time to be expended by skilled specialists in each case. (See article *Gonorrhœa*.)

There appears to be great need for some simpler test within the scope of the ordinary practitioner. E. F. Müller considers the injection of irritants into the urethra and the passage of sounds, with the object of provoking a discharge in which to search for the gonococci, are unnecessary, and he objects to vaccines because of their disadvantage in causing a general reaction. (These are the methods recommended by the Ministry of Health.) He suggests the intradermal injection of a solution of casein known as 'aolan'. This causes an increase next day of the urethral discharge, which can then be searched for gonococci.

As regards the treatment of gonorrhœa in both men and women, solutions of permanganate of potash, 1-4000 to 1-2000, as an injection, in conjunction with silver preparations, organic or inorganic, appear to be most popular. Internally, santal oil in doses of 10 min. is given three times a day, and a mixture of tinct. hyoscyami 5 min.; sodii brom. 10 gr., and liq. pot. cit. 1 drachm, is also used. In the gonorrhœa of women the value of glycerin to produce osmosis is regarded as a valuable part of the treatment, as the organisms may be deeply seated and remain untouched by superficial applications.

Silbersalvarsan has become a popular remedy in the treatment of *Syphilis*, but its use requires caution, since it is apt to provoke severe reactions. One method for its intravenous injection is to dissolve the dose in 2 to 3 c.c. of warm tap-water in a 10-c.c. syringe. After puncturing the vein, the piston is withdrawn until the syringe is full of blood and the solution before being pressed home. The admixture of albumin is said to reduce the toxicity of the drug.

In the eczema of young children the prohibition of soap is advocated, and the use of tepid rather than hot water for baths. Formulæ for suitable ointments are given in the article *Eczema*. Daily baths are advocated, with the addition of permanganate of potash sufficient to colour the water pink. Moist surfaces may be painted twice a week with a lotion of nitrate of silver 15 gr. to the ounce.

For the thickened areas often left by chronic eczema, the best application is crude liquid gas tar, painted once a week. In fissured lips an ointment consisting of lead plaster and vaseline with 2 per cent salicylic acid is recommended.

In *Furunculosis* the value of vaccines is discussed. The administration of 6 to 8 drops of hydrochloric acid in the middle of each meal, and a gramme of charcoal at the end of it, is suggested. Arsenic is contra-indicated for local treatment. The surrounding parts are powdered with zinc carbonate with 4 to 6 per cent of cupric sulphate.

In the treatment of *Lupus*, pyrogallic acid is regarded as one of the best of the caustic agents, and directions for its use are given. The use of x rays is deprecated except with special precautions. For small deep nodules, ionization with chloride or zinc sulphate solution is recommended. For lesions of the mucosæ, the electro-cautery is preferred. The use of tuberculin and salvarsan has proved disappointing. The employment of both picric brass and acid nitrate of mercury is also fully discussed.

The treatment of *Psoriasis* by sulphur injections has been modified, and the new formula will be found in the article. An injection is given at weekly intervals, and four or five injections constitute a course. It is claimed that the average duration of treatment is only three weeks. For *Scabies* the application of a 4 per cent solution of copper sulphate to the whole skin, after a bath with scrubbing, is recommended. For *Seborrhœa* a combination of sulphur and soap has proved of great value, but the article should be referred to, as much depends upon its proper application.

For excessive sweating of the feet, a powder containing 60 parts of alum and 40 parts of talc has proved very efficient.

In Dr. Graham Little's article, *Ulcer of the Leg*, a method of treatment is described which has proved very efficacious. After soaking in Burow's solution (alum 1 part, lead acetate 5, water 100) for three days, a plaster is applied of liquor plumbi subacetatis and lead plaster spread on a cloth. The leg is bandaged from ankle to knee. The plaster is only renewed every three days unless there is much discharge.

Immediate benefit in cases of *Diabetes Insipidus* usually follows the injection of pituitary extract, but as a rule the results are temporary. Three cases have been recorded in which lumbar puncture proved efficacious. The fasting treatment of *Diabetes Mellitus* has been much criticized during the past year. It is obviously less well borne by thin patients than by those who have a large reserve of adipose tissue. In most severe cases fasting should not be pushed too far, and the patient is best treated by being left with some glycosuria. The occasional day of abstinence from everything except large quantities of water is generally approved. Some excellent dietetic tables are given in the article.

The dietetic treatment of *Nephritis* is fully considered in Dr. John Comrie's article. In chronic parenchymatous nephritis Karrell's diet is said to be very beneficial. During the first week the patient is limited to 1½ pints of skimmed milk, with 6 ounces of coffee. Afterwards stewed fruit and cereals, cream, toast, and vegetables are given, and still later eggs and meat. No salt is allowed, and the fluid is restricted to 1½ pints a day.

Hingston Fox, in cases of albuminuria occurring in rapidly-growing persons, with headaches but no organic disease of the kidneys, recommends calcium lactate, 60 gr., taken in the evening.

The albumin reaction in the sputum of *Tuberculosis* has come under discussion during the year. While its diagnostic value has been questioned, it is regarded as of prognostic importance, as a positive reaction in a tuberculous subject indicates activity of the morbid process, the quantity of albumin being related to the extent of the lesion. Salomon regards it as an important test in incipient tuberculosis, which he considers is excluded by a negative test.

Maragliano has reported on the method of vaccination against tuberculosis which he advocated twenty-five years ago. His method is to produce a minute focus by subcutaneous injections of dead tubercle bacilli. The results appear to have been excellent, and the method seems worthy of fuller inquiry. Epinephrin is regarded as having absolute value in the prevention of night sweats in tuberculous subjects.

An investigation into the action of antipyretics shows that when given to tuberculous subjects they cause a subsequent reaction to the apyrexia, so that the temperature remains definitely higher than before the administration of the antipyretic remedy. Acetylsalicylic acid given to healthy individuals has a tendency to raise slightly the body temperature (DICTIONARY OF REMEDIES.)

Sodium citrate has been highly recommended in the treatment of *Pneumonia*. It is given in doses of 15 to 20 gr. an hour, with plenty of water, or 40 gr. every two hours until after the crisis. If a purgative effect is produced it is controlled by opium.

In *Bronchiectasis*, Jex-Blake advises the inversion of the patient so that he has his head and chest hanging downwards during the act of coughing, in order to enable him to empty the bronchiectatic cavities. Creasote is recommended to combat the infection. Its use by inhalation

is said to give admirable results of a palliative order. It is recommended to be mixed in equal parts with eucalyptus oil and oleum pini silvestris, and used with an inhaler to be worn for many hours a day.

In Dr. Arthur Latham's article on *Asthma* there is a report of cases of bronchial asthma treated with vaccines, and it is claimed that 74.6 per cent of cases resulted either in complete freedom from attack or considerable improvement. The peptone treatment for asthma is also fully considered and the technique explained. It is found to answer best in patients whose health is otherwise good, and who are free from bronchitis and emphysema.

The treatment of *Hay Fever* by pollen extract and the relation of hay fever to asthma have formed the subject of an interesting article of which a résumé appears under the above heading.

For the treatment of *Rheumatism* in all its forms an aqueous solution of salicylic acid 1-1000 by subcutaneous injection is advised. The injection is preferably given in the neighbourhood of an affected joint. It is also said to be beneficial in sciatica if injected over the point of "emergence of the nerve", which we assume is over the sacral plexus. (See ACID. SALICYL., p. 2.)

Under the title *Deficiency Diseases*, Dr. J. A. Nixon has brought up to date our knowledge of the defective dietetic conditions which cause scurvy, rickets, beri-beri, pellagra, and famine dropsy, and gives some valuable suggestions for meeting these conditions. An important point is that it is not enough to know that a particular accessory factor is present in the diet: there must be enough of it to avert trouble. A lack of tryptophane in the protein of maize has been suggested as one of the several factors responsible for the production of pellagra. It is not yet conclusively proved that rickets is a pure food-deficiency disease, nor that it is an avitaminosis, but there is ample evidence to show that, where fresh milk is lacking for infants, rickets will appear. Cod-liver oil appears to be the best substitute. In beri-beri the value and necessity of the fresh juice of oranges or lemons, raw egg, or 'marmite' are conclusively proved. In famine dropsy, cod-liver oil is a valuable agent in conjunction with an adequate supply of protein, and rest in bed.

Formerly abdominal colic was regarded as one of the ordinary and not very infrequent cases the physician was called upon to treat. Of late years abdominal pain had come to be regarded as an indication for immediate operation. Unquestionably in a large number of cases these operations were unnecessary, and lately surgeons are beginning to recognize the fact. But when, in cases operated upon, the appendix was found to be in any way impaired or the site of inflammatory changes, the operation appeared to be justified. In the article *Appendix* will be found the report of 500 cases of laparotomy during which the appendix was examined. None of these cases had any symptom of appendicitis;

yet one-third of them showed undiagnosed lesions. These were nearly all chronic in character. The observers were led to the view that these lesions were of no clinical significance, and doubted whether 'chronic appendicitis' was a clinical entity.

In the article *Abdominal Surgery*, Dr. E. Wyllys Andrews, writing of cases of acute abdominal pain, fever, vomiting, leucocytosis, and tympanites, says, "It is time to realize that a certain percentage of these can safely be treated expectantly, and the operation done at a more favourable time, or even avoided entirely".

It is difficult to overestimate the value of the work done in *Tropical Diseases* and the enormous saving of life and suffering which has resulted from the continual investigations that are being made by the indefatigable workers in this department. In Mesopotamia the house-fly is held responsible for the common bowel disorders.

The hepatitis which may occur as secondary to *Dysentery* has come under some discussion from the surgical point of view. In some cases simple aspiration by means of a 20-c.c. glass syringe yielded good results. Some follow them by the injection of quinine into the cavity. The use of emetine has unquestionably reduced the number of cases of liver abscess, and one writer considers that it not only arrests suppurative hepatitis but brings about an entire absorption of the pus and complete recovery in a large proportion of cases.

In bacillary dysentery, good results have followed three enemas, daily, composed of 15 to 20 drops of oil of turpentine, the yolk of one egg in 60 c.c. of distilled water, 5 to 20 drops of laudanum being added according to age. Bismuth salicylate and camphorated tincture of opium were also given by the mouth.

In the treatment of *Ankylostomiasis* (hookworm disease) the oil of chenopodium is still preferred to other remedies. This is also true of tartar emetic in *Bilharziasis*; but cases of the latter disorder have been treated with success by large doses of emetine given by intramuscular injection.

Prophylactic inoculations against *Cholera* have been employed with success. In the treatment of cholera, hypertonic saline and alkalis intravenously, and permanganates orally, have been employed.

In the treatment of *Kala-azar*, sodium-antimony-tartrate, as recommended by Sir Leonard Rogers, has been extensively employed. J. Dodds Price gave 3000 intravenous injections of the salt in cases of kala-azar and watched the results of double the number given by his assistants, and is convinced that the sodium salt is the means of curing the large majority of cases and is especially rapid in early ones.

A large measure of success has attended the treatment of *Leprosy* with sodium hydnocarpate and sodium morrhuate. Both drugs appear to have equal value. Sir Leonard Rogers has used the soya bean oil, and has prepared a 'sodium soyate' which proved far less irritating to the tissue than sodium morrhuate.

In the article *Malaria* some interesting facts are recorded respecting the prevention of malaria from its commercial side, the actual cost per head per annum for the methods employed, and the results attained. In the same article the question of the value of quinine served out daily as a prophylactic in tea-gardens in Assam is discussed. The experience of the observer was that it was a waste of time and money under the given circumstances. Discussion has taken place on the relation of blackwater fever to badly-treated malaria. There appears to be a critical dose in malarial subjects when quinine may induce blackwater fever. One writer considers that the addition of bicarbonate of soda or potash to the quinine will obviate this result.

Sir Leonard Rogers records additional cases of *Sprue*, treated with autogenous oral streptococci vaccines. P. Conran gives two cases treated in Scotland on meat diet with great success.

The cure of a virulent case of sleeping sickness (article *Trypanosomiasis*) is recorded. Atoxyl was first used intramuscularly, and then tartar emetic intravenously. The treatment was continued for two years, and no less than 500 gr. of tartar emetic were given during this period in $2\frac{1}{2}$ -gr. doses.

The medical, in place of the surgical, treatment of *Gastric and Duodenal Ulcer* has been advocated during the past year, and Dr. Robert Hutchison describes the methods employed. Some of these would be difficult to carry out except in a hospital, but they appear to have yielded good results, and the article is well worth consulting. We think that in these cases the attention is perhaps too much concentrated on diminishing the acid secretion of the stomach by chemical means and too little is paid to the functions of the liver. The diet and complete rest make this point one of considerable importance. In Mr. James Sherren's article on *Stomach, Surgery of*, Sir Berkeley Moynihan is quoted as saying that in more than half the cases of carcinoma of the stomach there is a history suggestive of the previous existence and of the recurrence of a gastric ulcer. That work in the direction of the prevention and cure of this condition will lower the incidence of carcinoma is quite probable.

While it is not safe to accept any single test as significant of *Pancreatic Disease*, the test of Loewi is well worth trying. Two or three drops of a 1-1000 solution of adrenalin chloride, freshly prepared, are dropped into the conjunctival sac, and the process is repeated in five minutes. If dilation of the pupil occurs it is presumptive of a pancreatic lesion. The passage from the bowel of liquid fat which solidifies on cooling is of course more diagnostic, and there are other symptoms of significance described by Dr. Robert Hutchison in his review of Garrod's lecture (*Pancreas, Diagnosis of Disease of*).

The question frequently arises as to how far we are justified in recommending prostatectomy as a solution of the troubles of some of our aged

patients. In Mr. Thomson Walker's article on *Prostate, Surgery of*, some very clear indications are given as to the choice of cases and the indications for surgical interference. As an early treatment in the first stage of hypertrophy, when there is no urinary retention, the operation is not regarded as justified. Much of the success and absence of mortality in the operation depends upon the most careful investigation of the patient's condition before operation. Pre-operative study and preparation are the first essentials in every case.

Dr. P. E. Weil is enthusiastic concerning the value of blood serum, not only for the hæmophilic state itself, but for the local result of it, i.e., persistent bleeding. Dr. Herbert French in his article *Hæmophilia* gives the author's method of using blood serum in such cases, and it may be hoped that a remedy has been found in one of the most intractable conditions which the physician is called upon to treat.

Myiasis, or the existence of maggots or other larvæ in the nose or other parts, is not an affection we meet with in this country, but it occurs in the tropics. It has been found that the administration of chloroform—if in the nose, by inhalation, or in the ear by pledgets of cotton-wool soaked in chloroform—causes the maggots to wriggle out of the affected part immediately.

The latest remedy for *Sea-sickness* is an injection of atropine $\frac{1}{160}$ gr. on embarking, and this is repeated on three successive days if necessary. If the sickness has already started, atropine $\frac{1}{160}$ gr. is administered at once, and a second dose of $\frac{1}{160}$ gr. twelve hours later if necessary. P. Cazamian, of the French Navy, is responsible for this method, which appears worthy of a trial.

Hereditary deafness is said by Kerr Love to be Mendelian in its incidence, and in the article *Deafness* a table is given to prove this, which may be of interest to our readers. Dr. John S. Fraser's article gives some useful information respecting methods of examining for deafness, with interesting remarks upon the psychological effects which loss of hearing produces. There are also some useful hints respecting artificial aids to hearing.

Nasal disease may be an unsuspected cause of headache. Frontal headache with a sense of oppression and occasional paroxysms of pain, developing on rising in the morning or after sneezing, suggests nasal disorder as a possible cause; in these cases cocaine, applied to the upper region of the nose, frequently relieves the pain at once (*Nose*).

The use of any form of lavage is contra-indicated in *Ozena*. The crusts should be removed by an oily spray followed by blowing. Vibratory massage is applied to the nasal mucosa daily, and deep inspirations and expirations are performed through the nose several times daily. Treatment on these lines is said to be curative.

Nasal drill has recently been suggested as a cure for enlarged tonsils and adenoids. The children are arranged in classes, each provided with a paper handkerchief, and are then taught to blow down the nostrils, at first both together and then either nostril alternately. Nasal-breathing exercises are also carried out, and sneezing is induced by the use of the menthol snuff with a soap basis (*Tonsils*).

Small doses of iodine are stated to be a valuable prophylactic against nasal catarrh and sore throat, and it is also recommended when the disorder is well established, doses being given twice daily. (*See IODINE*, p. 13.)

Mr. Lockhart-Mummery (*Rectal Diseases*) alludes to the shyness of the medical practitioner in making rectal examinations. As a result, over 50 per cent of serious cases of rectal disease are too seriously advanced for satisfactory treatment when first diagnosed. The examination should not be confined to the rectum, but the patient should be examined for other lesions, particularly in the genito-urinary tract. The value of bimanual examination is also insisted upon.

In the article *Hæmorrhoids* he states that there is a very close agreement amongst specialists that the ligature operation is the best in most cases; that stretching the sphincter is no longer necessary, nor the use of any kind of packing in the rectum. The patient may be allowed out of bed on the third or fourth day of operation. He also describes a new method for excision of the rectum which he has used in 65 cases with remarkably successful results (*Rectum, Cancer of*). Excellent results were obtained at St. Mark's Hospital by internal proctotomy for *Stricture of the Rectum*. With proper antiseptic precautions he regards it as a perfectly safe operation.

As an alternative to excision in the treatment of *Coccydynia*, injection of the nerve tissues in the neighbourhood of the coccyx is suggested. An 80 per cent solution of alcohol is employed. This is injected with a hypodermic syringe of 2-c.c. capacity. Several injections may be necessary.

THE MEDICAL ANNUAL.

Part I.—Materia Medica and Therapeutics.

DICTIONARY OF REMEDIES.

By FRANK J. CHARTERIS, M.D.

*Professor of Materia Medica, St. Andrews University; Extra Physician,
Royal Infirmary, Dundee.*

INTRODUCTION.

THE year under review has not been fruitful in important work. Very few new remedies or new methods of treatment have been brought forward. Most of the published work deals with the older drugs. Protein therapy has been extensively used therapeutically and some researches have been carried out in the hope that light may be thrown upon the mode of action.

ACETYSALICYLIC ACID.

The Antipyretic action of aspirin has been investigated by Barbour¹ by means of Benedict's respiration chamber. In healthy individuals 1 grm. has but slight effect on heat balance; an average increase of 6.1 per cent above the normal heat production was obtained, most evident during the fourth half-hour after oral administration. A very slight tendency to raise body temperature was observed. A marked antipyretic action was produced in fever cases, the effects being similar during actual fever, in febrile and afebrile phases, and in the first stages of convalescence. There was greatly increased loss of heat, associated with perspiration and subjective heat. The heat production was diminished slightly as compared with control days. The return to the initial temperature is brought about by a reduction in the heat elimination to about one-half of the normal figure, and is unaccompanied by shivering or marked increase in carbon dioxide output. Barbour cannot give an explanation of the increased sensitiveness of febrile, temporary afebrile, and convalescent subjects to antipyretics. It is not stimulation of a depressed centre, nor is it due to lack of a readily combustible substance. He suggests that perhaps it has something to do with carbohydrate metabolism.

REFERENCE.—¹*Arch. of Internal Med.* 1919, Dec., 611, 617, 624.

ACIDUM HYDROCHLORICUM.

Bastedo¹ concludes that in *Achylia Gastrica*, whether or not accompanying pernicious anæmia, a deficiency of acid may be partially overcome by oral hydrochloric acid administration. Pepsin should always be given along with the acid. If the achylia is associated with diarrhœa, acid promises a more noticeable effect than in achylia without diarrhœa. The administration of acid should not be continued if it produces sourness and irritation of the stomach. To prevent acidosis, alkalis should be administered, though not at

the same time as the acid, the alkali required being judged by the effect produced on the urine. He advises the administration of almost all the daily supply of putrefactive protein at one meal in achylia, so that the use of HCl is restricted.

REFERENCE.—*Amer. Jour. Med. Sci.* 1921, Jan., 58.

ACIDUM SALICYLICUM.

Sejournet¹ advises local subcutaneous injections of 1-1000 watery solution of salicylic acid in all forms and manifestations of **Rheumatism**, articular or muscular, subacute or chronic, polyarticular or mono-articular. In all cases he gives an injection of 1 c.c. somewhere in the neighbourhood of the joint, as near as possible to the interarticular line. A single injection is usually sufficient, but if necessary may be repeated daily. He claims that cure is rapid and generalization of the disease is often prevented. In chronic rheumatism several injections are required. Muscular rheumatism is very amenable to injection as near as possible to the painful spot. No benefit is obtained in rheumatoid arthritis or arthritis deformans. *Sciatica* responded well to daily injections over the point of emergence of the nerve.

REFERENCE.—¹*Med. Press and Circ.* 1919, Dec. 31, 527.

ADRENALIN.

Fischer¹ discusses a case in which the accidental injection of 10 c.c. of 1-1000 adrenalin caused the death of a man of 35. The intention was to use 10 c.c. of a novocain solution, but by mistake adrenalin was injected into the subcutaneous tissue and muscles of the leg. Almost immediately after the injection the patient became distressed, with sharp pain in the head and neck, and palpitation. The pupils dilated, subsequently contracting. Death resulted within six minutes of the injection. Post mortem, status thymolymphaticus was found. In the German pharmacopœia the maximum dose of adrenalin hydrochloride is given as 1 mgrm. No details as regards method of administration are offered. Ritzmann has determined experimentally that in animals only 6 per cent of the dose given subcutaneously or intramuscularly reaches the circulation. From this Fischer concludes that in his case a quantity corresponding to 0.6 mgrm. intravenously proved fatal. Very large quantities can be administered in separate small doses. Thus Fischer refers to Kirchheim's case, where 1 mgrm. was given half-hourly, equal to 48 mgrms. in the twenty-four hours. This patient received in all 400 mgrms. during his illness, without apparent harm.

REFERENCE.—¹*Munch. med. Woch.* 1920, July 23, 872.

ADSORBED ALKALOIDS.

The fact that Lloyd's reagent, a form of fuller's earth, forms adsorption compounds with many alkaloids, has led to the introduction of such compounds for clinical use. Sollmann¹ denies that these compounds are of value, as he found that the alkaloid cannot be extracted from the adsorption compound by water or an aqueous solution of sodium bicarbonate having the alkalinity of the intestinal juice. Clowes and Walters² have, however, observed systemic action from the oral administration of such adsorption compounds, and subsequently showed that the presence of slightly alkaline or neutral soaps and other bodies often present in the intestines liberates the alkaloid.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, Oct. 11, 1125; ²*Ibid.* 1920, Sept. 4, 655.

ALLERGY. (See DRUG REACTIONS, ABNORMAL.)

ANTIPYRETICS. (*See also ACETYSALICYLIC ACID.*)

Königer¹ states that antipyretic drugs, in addition to the sedative and fever-reducing action, also cause definite alteration in the course of the disease. This aspect he has tested in tuberculosis. If used intermittently—i.e., with sufficiently long pauses between administration—he claims that the majority of tuberculous individuals react subsequently to the apyrexia with a period of febrile reaction in which the temperature remains definitely higher than before the administration of the antipyretic remedy. He recognizes three types of febrile response: (1) An immediate sharp rise of temperature; (2) An irregular rise of temperature lasting two or three days; (3) A very slight, often hardly perceptible, rise, lasting for several days, and then followed by a marked fall. The nature of the response depends less on the size of dose than on the stage of fever at which it is administered. This effect on the subsequent course of the temperature does not represent the whole action of the antipyretic drug, as in addition there is often a focal reaction in which the local-signs of disease become more pronounced after the antipyretic sedative stage ceases. Advantages of this can be taken in treatment of the tuberculous process.

Macht and associates² have carried out certain researches on the pharmacological action of antipyretics. He finds that antipyretics lower the pain threshold. The effect on reaction time differed from that produced by opium alkaloids. There was no period of shortened reaction time, but the antipyretic, if producing any effect at all, prolonged the reaction time, the simpler reactions to light, sound, and touch being more affected than the complex association tests. This again distinguishes these drugs from the opium alkaloids, which mainly depress the more complex association tests. As regards field of vision, the antipyretic, if acting at all, tends to increase it slightly. Interesting and unexpected effects upon hearing were noted. Some antipyretic drugs, both in normal and slightly deaf people, increased the acuity of hearing—e.g., acetanilide, salol, and aspirin decrease, while antipyrin, small doses of quinine, and pyramidon increase acuity of hearing. Rather extraordinary effects were produced by combinations of the drugs. Thus acetanilide alone reduces, but with sodium bicarbonate increases, hearing. Even more striking is the effect of combining salol and acetanilide, both of which given alone reduce hearing, yet in combination result in improved hearing.

REFERENCES.—¹*Munch. med. Woch.* 1910, Feb. 3, 205; ²*Johns Hop. Hosp. Bull.* 1920, May, 167.

ANTIPYRIN.

Widal and Vallery Radot¹ record an interesting case of antipyrin anaphylaxis in which they were able to determine the gradual development, long persistence, and comparatively rapid removal of the condition under appropriate desensitization treatment. The patient was a woman who suffered from recurrent migraine attacks at her menstrual periods. She commenced to use antipyrin for the migraine at the age of 24, and continued for nine years without any inconvenience, when she began to show symptoms of diabetes. From this time on, each administration of the drug was followed in five to twelve minutes by a burning sensation in the lips, with subsequent circumoral redness and swelling, and formation of small vesicles on the affected parts which gradually dried up in the course of the next few days. On medical advice she ceased to take antipyrin after the anaphylactic symptoms had been present for nine years. After an interval of seven years it was found that the drug still produced the same anaphylactic effects. The degree of reaction was the same with doses of from 0.05 to 0.75 grms., but 1 cgrm. or less did not produce any reaction. The process of desensitization was success-

fully accomplished in fifteen days by administering every two or three days minimal doses of 3, 2, 1, and $\frac{1}{2}$ cgrm., followed one hour afterwards by large doses of 25 to 50 cgrms. In this way very slight transient manifestations, lasting only a few minutes, were noted. Progressive desensitization continued, so that at the end of two months the patient could take with impunity 1 grm. The authors point out the similarity in this case to alimentary asthma and migraine. In all alimentary cases the production of sensitization necessitates years, as against days or weeks with sensitization by subcutaneous or intravenous administration. It then persists for years if untreated, but gradually diminishes in old age.

REFERENCE.—¹*Presse méd.* 1920, Feb. 4, 93.

ANTISEPTICS. (See also POTASSIUM PERMANGANATE ; SOAPS.)

Wedgeforth and Essick¹ find that the subarachnoid injection of antiseptics produces greater initial toxicity than with application elsewhere. In addition, microscopic examination of the central nervous system demonstrates anatomical changes, which persist after the initial toxic action has ceased. Even without obvious signs of toxicity, changes may be produced in the cerebrospinal fluid. Thus, after small amounts of chloramine, there is great increase in the white cells and globulin content of the cerebrospinal fluid, which does not pass off for several days. Secondary death may occur from direct injury to the central nervous system. Even when secondary death does not occur, pathological changes are found in the meninges causing incomplete obliteration of subdural and subarachnoid spaces, with serofibrinous exudate.

REFERENCE.—¹*Jour. Pharmacol. and Exper. Therap.* 1919, xiii, 335 (abstr. in *Surg. Gynecol. and Obst.* 1920, Jan., 39).

ARSPHENAMIN.

Reasoner and Nichols,¹ from a study of the literature of arspenamin in **Non-syphilitic Disease**, come to the following conclusions. For practical therapeutic purposes, the beneficial effects of arspenamin and neo-arsphenamin are most apparent in a limited number of spirochætal diseases. They are specific in **Vincent's Angina**, **Relapsing Fever**, **Yaws**, **Gangosa**, **Human Pulmonary Spirochætosis** (if given early), and in equine influenza. A therapeutic effect is obtained in **Rat-bite Fever**, in certain dental conditions, and in fowl spirochætosis. No apparent benefit occurs in **Weil's disease** and **yellow fever**. In **Syphilitics** good results ensue in certain non-specific conditions affected adversely by syphilis. The alterative action of arsenic is as readily produced by **Fowler's solution**. In a certain number of **Protozoal Diseases**—**Malaria** (tertian and quotidian), some forms of **Trypanosomiasis**, and **Leishmaniasis**—a limited effect is produced. Except **Anthrax**, and possibly **Glanders**, few favourable results are reported in bacterial infections. Apart from local applications in **Vincent's angina**, intravenous injection in medium doses should be preferred. Two or three injections usually suffice, except in pulmonary spirochætosis, which may require a series of injections. Neo-arsphenamin is preferred as less toxic in diseases showing liver involvement.

Smith² states that the rise in pulmonary pressure following the intravenous injection of arspenamin is due to obstruction of the pulmonary vessels, either mechanical blocking or a constricting of the vessels, depending on the amount of alkali used in making the solution.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1920, Sept. 4, 645 ; ²*Jour. Pharmacol. and Exper. Therap.* 1920, June, 279.

ASPIDOSPERMA (Quebracho).

Wilcox¹ states that aspidosperma is a dried bark officially recognized in the U.S. Pharmacopœia. It contains six alkaloids. Commercial aspidospermine probably contains all these alkaloids, and its action represents that of the crude drug. There is an official fluid extract of quebracho used in 1-drachm doses. This fluid extract has an astringent, slightly aromatic, taste. It produces a temporary fall in blood-pressure of cardiac origin. The blood is stated to become bright red, even in the veins, and it is asserted that the power of the blood to take up oxygen is increased. The main action is upon the respiration. In small doses there is increase in depth, and with large doses increase in rate and especially in depth of respiration, the air moved being quadrupled. This action seems to be central in origin. It has both nauseating and expectorant properties and also depresses the respiratory centre. Therapeutically the drug is useful in embarrassed respiration—e.g., in **Emphysema**, **Chronic Bronchitis**, or **Chronic Pneumonia**. In proper doses it relieves promptly not only the dyspnoea but also cyanosis and sense of suffocation. It appears to assist oxygenation of the blood. It may relieve symptomatic **Asthma** from uræmia, cardiac hypertrophy, or secondary to anæmia. **Asthma** not due to serious organic disease is improved; it does not remove an attack, but seems to prevent subsequent recurrence.

REFERENCE.—¹*Med. Record*, 1919, Oct. 25, 698.

ATROPINE.

Bastedo¹ by fractional analysis has investigated the gastric action of certain drugs. Atropine had no useful effects in any dosage upon hyperacidity. In continuous hypersecretion cases it may check the secretion after the digestive period, but only if given in maximum doses. In pylorospasm it may be useful, but again only in maximum doses. In the doses customarily used it is wholly without effect on secretory or motor function of the human stomach.

REFERENCE.—¹*Amer. Jour. Med. Sci.* 1920, Jan., 53.

BENZYL BENZOATE.

Opium contains numerous alkaloids, which can be divided into two classes: (1) Pyridin-phenanthrene group, of which morphine is the representative; and (2) Benzyl-isoquinoline group, of which papaverine is the chief representative. Macht¹ found that these two groups acted differently on plain muscle. The pyridin-phenanthrene bodies stimulate the muscular contractions and increase tonicity, whereas the benzyl-isoquinoline group inhibit contractions and lower tonicity. In combinations of the two groups the benzyl-isoquinoline group exerts the predominating action. Subsequent investigations showed the stimulant action of the pyridin-phenanthrene group to be due to the pyridin portion of the molecule, and the depressant action of the benzyl-isoquinoline group to the benzyl grouping in the molecule. He then set himself the task of procuring the inhibitory and tonus-lowering action by a simpler benzyl grouping than occurs in the benzyl-isoquinoline alkaloids. The two esters, benzyl benzoate and benzyl acetate, were tested. Benzyl benzoate is found in various balsams—e.g., Tolu, Peru, and Storax. Experiments on animals proved these substances to have the same pharmacological action as papaverine, but they are less toxic. The benzyl group, in animals, is largely converted into hippuric acid, and as such is excreted in urine, bile, saliva, and pancreatic juice. Oral administration produced no untoward or even disagreeable symptoms, but the benzoate is pleasanter, and may be administered in alcoholic or oily solution, or as capsules. Both drugs may be given in oil

intramuscularly. The drugs were successfully used in cases of **Excessive Intestinal Peristalsis**, **Intestinal Colic** and **Enterospasm**, and **Pylorospasm**, either functional in character or reflexly produced by ulcers and neoplasms. A useful field was also found in **Spastic Constipation**, **Biliary, Renal, or Ureteral Colic**, **Vesical Spasm**, and **Uterine Colic**. In **Arterial Hypertension** more lasting effect was produced by oral administration of benzyl benzoate than with nitrites; both systolic and diastolic pressure are reduced. The drug causes no deleterious action on the kidneys even in nephritis. In numerous cases of true **Bronchial Spasm**, benzyl benzoate gave relief.

Boice² furnishes clinical summaries of cases treated by himself and other observers which indicate that the new drug is a useful non-narcotic antispasmodic. For therapeutic purposes benzyl benzoate should be free from chloridine, contain not less than 97 per cent of absolute ester, boil between 320° and 325° C., and have a specific gravity at 25°C. of 1.1151. The ester is almost insoluble in water or glycerin, but dissolves in alcohol, ether, chloroform, or olive oil. The dose is 0.3 to 0.5 c.c. (5 to 7 min.). From 10 to 30 min. of a 20 per cent alcoholic solution may be given four times daily in cold water. Litzenberg³ employed in **Dysmenorrhœa** a 20 per cent emulsion with acacia, flavoured with elixir of eriodictyon, in doses of 1 to 2 teaspoonfuls every two hours, and obtained relief of pain in 35 out of 43 patients. No bad result from this increased dosage was seen apart from occasional vomiting, and rarely a feeling of weakness. He considers it practically non-toxic and preferable to atropine, and recommends that the drug be tested in dysmenorrhœa.

Macht⁴ further states that benzyl benzoate is an invaluable remedy in the treatment of persistent **Hiccough** of both adults and children. It is effective against the ordinary mild types as well as the more persistent, almost pernicious, types lasting from twenty-four hours to several days, which prove refractory to ordinary medical treatment. It seems more valuable against hiccough of peripheral origin than hiccough of central origin. He advises the administration as a 20 per cent solution in alcohol. The dose of this solution is 20 to 40 min. in water or milk.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, Aug. 23, 599; ²*N. Y. Med. Jour.* 1919, Dec. 15, 977; ³*Jour. Amer. Med. Assoc.* 1919, Aug. 23, 601; ⁴*Med. Record*, 1920, July 24, 146.

BILE.

Bensaude and Vincent¹ state that 5 grm. extract of beef gall dissolved in 250 c.c. of water, administered as an enema, is valuable in chronic **Constipation**. The gall keeps well. In this dose it does not produce griping.

REFERENCE.—¹*Bull. Soc. méd. Hôp.* 1919, Nov. 7, 932.

BITTERS.

Bastedo¹ thinks that bitters are useful appetizers in subnormal nutrition or in convalescence. They should be given in solution not more than five to ten minutes before the meal. They act in **Achylia**, and in **Subacidity** promote secretion of gastric juice. The dose should just be sufficient to give a strong acid taste. The bitters may lessen a normal appetite, or nauseate if the stomach and bowels are deranged. The action is solely on the taste buds, and will not be seen, in normal nutrition, if the patient is psychically disturbed.

REFERENCE.—¹*Jour. Amer. Med. Sci.* 1920, Jan., 63.

BLOOD TRANSFUSION. (See TRANSFUSION OF BLOOD, p. 21.)

CAFFEINE.

Several cases of gas gangrene have been noted after the injection of caffeine. A typical fatal case is recorded by Schranz.¹

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1920, May 22, 1493.

CAMPBOR.

Cheinisse¹ has an interesting article on the disadvantages of camphor-oil injections. Relatively enormous quantities of camphor in oil can be administered hypodermically. He quotes cases where a child of six received hypodermically 220 c.c. of a 20 per cent oily solution of camphor in eleven days, equal to 44 grms. of camphor. These high quantities can only be given because the camphor is slowly taken up by the blood, and then probably is rapidly converted into glycuronic acid compounds. In animals 2 cgrms. per kilo body-weight intravenously produce convulsions. The slow absorption from oily solutions renders the subcutaneous administration unsuitable for rapid stimulation. Recently the drug has been given subcutaneously; but Fröhlich and Pollak,² while pointing out the cardiac and peripheral vasodilator action, state that camphor is contra-indicated in irritable heart, especially in tachycardia not due to infection. As the drug causes extrasystoles, it is also contra-indicated where these are present. Their experiments were carried out on surviving hearts of white rats weakened by drugs and toxins. They find that camphor increases the irritability of the heart, quickening the rate and removing irregularities. In combination with vasodilators—e.g., diuretin and papaverine—camphor exerts a greater stimulating action on the heart. Starvation seems to increase the toxic action, since some experiments carried out in 1912 by Happich indicate that the absence of glycuronic acid increases the toxicity. Though the slow absorption after subcutaneous administration permits the injection of large quantities of camphorated oil, the ultimate results are often unpleasant, since large tumours may develop, even many months after the injection, which are painful and show a marked tendency to spread along the vessels, increase in size, and even recur after extirpation. These swellings may occur whether paraffin oil or a vegetable oil is used to dissolve the camphor.

REFERENCES.—¹*Presse méd.* 1920, June 23, 416; ²*Arch. f. exper. Pathol. u. Pharmacol.* 1920, March, 104, 127.

CHENOPODIUM, OIL OF.

An investigation by the Uncinariasis Commission to the Orient¹ indicated that chenopodium is more satisfactory than thymol in the treatment of Uncinariasis. Both drugs are about equally efficient in removing *Necator*, but chenopodium is undoubtedly superior to thymol in removing the more resistant species of hookworm—i.e., *Ankylostoma*—and is also more efficient in removing other worms such as *Ascaris* and *Trichuris*. Failure to remove all hookworms occurred in 23.6 per cent of the cases treated with thymol, whereas the percentage of failures with chenopodium was only 7.6 per cent. Chenopodium is most efficient when given pure. It is less effective when emulsified. The half-maximum dose (0.5 mil three times, or a total of 1.5 mils) is the best routine treatment, producing less toxic action than the full doses; yet with two treatments over 99 per cent of all worms present are removed. When few worms are present it is less easy to effect complete removal. Though pleasanter to take than thymol, chenopodium is more likely to produce toxic symptoms. Thus dizziness, unsteadiness of gait, inability to rise, semicomatose state, tingling of hands and feet, are all observed. Giddiness was always seen, especially after the second dose. It is more marked in men than in women.

Albuminuria is also frequently produced, especially if full doses of chenopodium are given. Excretion of absorbed chenopodium is slow and may extend over five days. Consequently the second treatment should not be given before four to seven days have elapsed. Any serious toxic symptoms occur usually after the second treatment.

REFERENCE.—¹*Rockefeller Foundation International Health Board, Publication No. 9, 1920.*

CLEAVAGE PRODUCTS FROM BACTERIA AND TISSUES.

Late post-traumatic multiple softening of the brain following penetrating gunshot wounds of the skull has been investigated by Ivannovics.¹ Similar changes are produced in white rats after repeated slight hammering of the skull and parenteral injection of emulsified brain. He suggests that cytotoxins are formed which act on the brain tissue slightly damaged by the concussion. Possibly a similar explanation holds good for the rare cases when myelitis occurs after Pasteur treatment for rabies. Arising from these observations, Ivannovics tested the effect upon neoplastic and granulomatous tissue of cleavage products obtained by digestion of similar type tumours. The products of digestion pass through filter-paper, but not through porcelain, unchanged in activity, and are sufficiently thermostable to be sterilized by fractional heating. Digestion products of carcinomatous tumour injected subcutaneously produced characteristic changes in carcinomatous growths. The lymph vessels dilate; at the periphery a plasmodium formation occurs which develops into a connective-tissue proliferation which surrounds the growth as a capsule. Subsequently the connective tissue spreads through the tumour and the pathological epithelial cells tend to shrink and atrophy. These beneficial changes are best seen in small growths and in patients still in fairly good condition. They are not seen in very weak cachectic individuals. Similar cleavage products obtained by digestion of non-malignant tumours were active against the same type of tumour, producing stagnation of lymph, proliferation of connective tissue, and retrograde changes in the epithelial tissue cells. In uterine myomata the retrograde changes consist in liquefaction of pathological tissue, possibly due to stimulation of autolytic ferments, while the normal uterine tissue is not affected. The next step was to study the effect of digesting pure cultures of bacteria. In the case of tubercle bacilli a dark-brown liquid is obtained, which, injected subcutaneously or intracutaneously, produces no local or systemic reaction, but induces well-marked changes in tuberculous tissue, shown by increased phagocytosis of tubercle bacilli and subsequent proliferation of connective tissue.

A few clinical reports are already available of these digestion products. Fuhs² used digestion products of *Trichophyton* cultures. No beneficial effect was seen in superficial types—e.g., herpes tonsurans—but deep-seated syphilis was favourably influenced by subcutaneous or intracutaneous injections. The healing process was stimulated and shortened. The main distinction from vaccine treatment was the absence of inflammatory reaction and the dry resorption instead of increased secretion. Scherber³ tested carcinoma digestion fluid in epitheliomata. Subcutaneous injection at four- to seven-day intervals produced fairly severe local reaction lasting up to three days, with occasionally, especially in old weakened patients, a general febrile reaction and languor. The local reaction varied in intensity, and tended to be less marked on repeated injection. With the local is seen also a focal reaction in the tumour, consisting of a feeling of tension, sometimes burning and pricking, accompanied by marked swelling and reddening, with increased secretion. The focal reaction lasted two to three days, and was followed by an increased formation of crusts,

which separated in four or five days, leaving the tumour paler and flatter, with increased epithelization. The best therapeutic response was obtained with long intermission between the injections. The ultimate results were not very striking: a few superficial epitheliomas healed up entirely. In the other cases temporary improvement was seen with the first eight to ten injections, but further injections produced either no improvement or so marked a reaction that former benefit was lost. In any case the treatment is very protracted, but should be further tested in inoperable cases.

REFERENCES.—¹*Wien. klin. Woch.* 1920, July 22, 649, ²*Ibid.* 653; ³*Ibid.* 654.

COLLOIDAL DRUGS.

Colloidal solutions are not to be relied on unless they are fresh.¹ The best guarantee is to stipulate for a reputable maker. As **Germicides**, their action is interesting. Bacteria, physically considered, are colloidal in character, and are negatively charged. If this negative charge is neutralized by a positive charge, the bacteria are precipitated. Thus, theoretically, all positively charged colloids are antiseptic, while in addition to this precipitation some may be chemical antiseptics. The following positively charged colloids are strongly antiseptic: mercury, silver, mercuric chloride, mercuric cyanide, thorium, arsenious acid, antimony, cobalt, and iron; the following are weak antiseptics: aluminium, bismuth, copper, lead. Though positively charged, the following are non-germicide: sulphur, gold, platinum, zinc, tin, magnesium.

Colloidal Metals.—De Arrie² has investigated the action of colloidal metals on certain toxins. Several toxins are very susceptible to the action of diastases, intestinal juices, and oxidizing agents in general. As in many cases the action of these oxydases, whether natural or artificial, is in part at least due to the presence of traces of metallic bodies probably in colloid form, it was interesting to determine what action on toxins was produced by pure colloid suspensions. No effect in diminishing the toxicity was seen in animal experiments when the toxin and colloid were separately injected, but in some cases the toxicity was distinctly diminished when the toxin, before injection, was mixed with the colloidal substance. Different metallic colloids vary in action. Thus colloidal silver, gold, and platinum do not affect diphtheria toxin when allowed to act for one hour; but colloidal iron and manganese distinctly diminish the toxicity of diphtheria toxin under these conditions. De Arrie also tested the effect of various metallic colloids on the toxin and lysin prepared from staphylococci. Similar results were obtained. Silver, gold, and platinum produced no diminution in the toxicity of the staphylo-toxin, but both iron and manganese colloids distinctly reduced the toxicity when the toxin was exposed from one to two hours at 37° C. before injection. The hæmolytic action of the lysin was not affected by the presence of colloidal gold, silver, or platinum, and iron colloid was also almost without action, whereas manganese colloid effectually inhibited the lysis of rabbit corpuscles. The author suggests that the effects are produced either by an oxidation process or by the formation of a new inert colloidal complex from the metallic colloid and the toxin colloid.

Nicholson³ believes that the best method of exhibiting *bismuth* is in the colloidal form. Careful addition of about 90 min. of diluted nitrohydrochloric acid to 6 drachms of liquor bismuthi et ammonii citratis produces a fine colloidal suspension of bismuth. The liquor bismuthi is diluted with aqua menthæ pipéritæ in a 6-oz. bottle, and the acid, diluted, is added last, throwing out the bismuth as a dense white cloud. According to the alkalinity of the bismuth preparation, slightly more or less acid may be required. The addition of acid is stopped when the white cloud has reached its maximum density.

In tablespoonful doses, just before or after meals, excellent results are obtained in **Acid Dyspepsia**. Tincture of *nux vomica* (5 to 10 min.) or liquor *arsenici hydrochloricus* (2 min.) may be added. Properly prepared, the bismuth colloidal cloud is fairly permanent, but eventually is changed into an inert, dense, gritty precipitate. It is sometimes advisable to dispense the bismuth and acid in separate bottles, equivalent quantities being mixed to form each dose.

Colloidal Sulphur.—Comrie⁴ maintains that intramuscular injections of colloidal sulphur are of the greatest value in the treatment of **Subacute Painful Conditions of Muscles and Joints**, even when these have lasted for several years. The most satisfactory course of treatment is an injection every second day, over a period of three weeks, combined with rest, massage, and hot baths.

Harry⁵ warmly recommends local application of colloidal sulphur in the treatment of **Serophulosis**, along with suitable constitutional treatment. For cases associated with secretion, suggesting infection with micro-organisms, good results are obtained with 1 per cent collosol sulphur as eye-drops or nasal instillations. Speedy relief from **Photophobia** and **Blepharospasm** is got by sponging the lids and neighbouring region with the same solution diluted with an equal part of cold water. The collosol sulphur is cleansing, stimulating, and antiseptic.

Mukerjee⁶ finds intravenous injections of colloidal sulphur and mercury valuable in specific **Gonorrhœal Arthritis**. The initial dose is 4 min., increasing ordinarily by 2 min. every other day. The usual course consists of six injections. As a rule there is no reaction, but improvement follows each injection both in the local condition and in the general health. Waller⁷ has used intramuscular injections of colloidal sulphur in **Rheumatism**, **Arthritis**, and **Neuritis**. Several cases have been striking successes; others have given negative or doubtful results. The injection may, unless the dose is small to commence with, produce considerable local pain and constitutional disturbance. He advises 0.2 c.c. as the initial dose, working up to 2 c.c. as tolerance is established.

REFERENCES.—¹*Prescriber*, 1920, June, 219, 221; ²*Comptes rend. Soc. de Biol.* 1919, Oct. 11 and Dec. 20; ³*Prescriber*, 1920, June, 244; ⁴*Ibid.* 240; ⁵*Ibid.* 242; ⁶*Ind. Med. Gaz.* 1919, Sept., 338; ⁷*Prescriber*, 1919, June, 118.

DRUG REACTIONS, ABNORMAL.

Cooke¹ discusses peculiar drug reactions. He holds that with any normal person a drug may produce (1) a certain normal action, (2) a side action, (3) in larger doses a toxic action. Persons with idiosyncrasy to the drug may manifest exaggerated normal and side actions, perhaps from abnormal absorption, excretion, or destruction of the drug. Distinct from these effects (idiosyncrasy) he recognizes another allergic response occasionally seen, in which there is a peculiar and specific response to doses usually innocuous to average individuals. These hypersensitive reactions are due to allergy. Anaphylaxis is an antigen-antibody reaction artificially induced by immunologic processes. Allergy is a natural hypersensitiveness not produced by immunologic processes, the exciting agents, allergens, being in many cases incapable of producing antibodies. Thus, aspirin is not able to produce antibodies. Similarly, hay fever is an allergic hypersensitiveness to pollen. Allergic drug reactions are an inherited trait. They are absolutely apart and separate from any normal or toxic action, and always of the same nature as those that occur with foods, pollen, and animal emanations. The symptoms are coryza, cough, bronchial spasm, sometimes with urticaria or angioneurotic oedema, frequently with

gastro-intestinal manifestations, pain, vomiting, diarrhœa. Occasionally, with antipyretics, hyperpyrexia or cardiac collapse occurs, and marked eosinophilia. Allergic reaction to aspirin is perhaps the most frequently seen. Cooke refers to 15 cases. Symptoms come on within fifteen to twenty minutes of administration. In 9 cases violent bronchial spasm was induced, lasting from eight to thirty-six hours. In these cases urticaria was seen. In urticarial cases only is skin hypersensitiveness evidenced on intradermic injection of minimal doses. In most cases drug allergy depends on the chemical molecule as a whole, though in a few cases it depends on only a fraction of the molecule. Thus, 3 of the 9 which showed a bronchial reaction to aspirin did not react to salicylic acid, benzoic acid, or methyl salicylate. On the other hand, iodoform hypersensitiveness is due not to the iodine but to the CH_3 group. (See also ANTIPYRIN.)

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1919, Sept. 6, 759.

GENTIAN VIOLET.

Churchman¹ claims that this dye has valuable properties as a selective bacteriostatic (growth-preventing). The action is produced even by high dilutions *in vitro*, and in the actual treatment of wounds a similar action is seen. In Wounds, as in test-tube experiments, Gram-negative organisms are little affected by the dye, whereas Gram-positive organisms are inhibited from growth. The dye penetrates tissue well, but in order to obtain good clinical results the surface of the wound should be thoroughly cleansed. The skin round the wound is cleansed in the ordinary way, then the granulations are gently washed with neutral soap, dried by mopping, and then flooded repeatedly with hydrogen peroxide till all granulation tissue is left naked. Minute pockets are carefully cleaned, and also the area where skin joins granulation tissue. Lastly the granulations are dried and a saturated watery solution of gentian violet is painted on. After the first coat dries, a second is painted on, and then a dry dressing is applied. The clinical results were good in amputation stumps infected with diphtheria bacilli or ordinary organisms. The local application to the granulations does not produce dermatitis.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1920, Jan. 17, 145.

GLUCOSE SOLUTIONS, HYPERTONIC.

Hypertonic glucose intravenous injections, usually as 25 to 30 per cent solutions, have been used a good deal in America in cases of toxæmia as a means of stimulating diuresis and dehydrating the tissues. Wells and Blankinship¹ have used them extensively in *Influenzal Pneumonia* with considerable success. Their experience deals with 319 cases, which they divide into three classes. In the first series were fairly severe cases which yet would have chances of recovery with usual treatment; with glucose injection none of these cases died. The second class represented severe cases which yet had some hope of recovery with ordinary treatment; of the 124 cases comprising this class, only 8 died with glucose treatment. The remaining 83 cases were desperately ill, and under ordinary treatment had no chance of recovery; yet with glucose treatment 29 recovered. They found that a 10 per cent solution gave as good results as a 25 per cent solution. Most authorities use a 25 to 30 per cent solution of chemically pure glucose made with doubly distilled water. The glucose solution is sterilized by boiling. The amount of the solution injected intravenously is 250 to 300 c.c., and the injection should be made very slowly, requiring at least thirty to forty minutes. After-effects are seldom seen; occasionally a slight shivering and febrile reaction. The injection can be repeated at fairly frequent intervals of 8, 12, 18, or 24 hours.

Rathery and Boucheron² state that glucose injections are contra-indicated in chronic nephritis.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1920, Jan. 10; ²*Bull. Soc. méd. Hôp.* 1920, Jan. 16.

INTRAVENOUS INFUSION, CONTINUOUS.

Friedemann¹ has an interesting paper recording his experience with this method of treatment, which he has now used for over seven years. He uses a very simple apparatus, consisting of an ordinary filter funnel or separator connected by rubber tubing to a Martin's bulb of the type used for continuous infusion into the rectum. The Martin's bulb is connected by tubing to a small, slightly bent, glass cannula. The cannula is introduced into the exposed vein and is tied in securely. As infusion he mostly employs 0.9 per cent salt solution, occasionally Ringer's solution, and for special purposes adrenalin, digalen, sugar, or blood may be added. The rate of the infusion is regulated by means of a screw above the Martin's bulb. Frequently in collapse conditions the fluid is run in rapidly at first till the pulse improves, whereupon the flow is reduced to 20 to 30 drops per minute. The infusion may be kept up for hours. The longest period he records is thirty-five hours, during which 4 litres of salt solution, 120 drops of adrenalin, 40 c.c. of hormonal, and 1 litre of calorse solution (an invert sugar) were administered. The patient eventually recovered from a diffuse peritonitis. Several cases received continuous infusion for seven to ten hours. There is little risk of thrombosis or embolism. Unlike many writers, Friedemann seems to use a very simple technique. He lays no stress on maintaining the fluid at a constant temperature, and when transfusing blood has apparently abandoned preliminary agglutination tests. In some cases of internal bleeding he simply recovers the effused blood, strains it through gauze, and adds it to the solution. In other cases, where blood is obtained from donors, he adds 20 c.c. of 3 per cent sodium citrate to each 100 c.c. of blood. He holds that his method of continuous intravenous infusion, as contrasted with a rapid large injection, causes less strain on the patient, gives more lasting improvement, permits the administration of food (sugars), and is specially advantageous where a drug with evanescent action is used. The continuous infusion is usually well borne, but some care is necessary in stout patients with fatty hearts, or in elderly arteriosclerotics, lest too much fluid is introduced. The indications for continuous infusion are as follows: **Loss of Blood** (commencing with saline solution, and if necessary adding blood) as in **Ruptured Organs, Extra-uterine Pregnancy, Post-partum Hæmorrhage**. It is also a useful method in **Exhausted Conditions** from such causes as operation and parturition, and is a valuable preliminary to operations in weakened and exhausted patients. A special field is constituted by **Dehydration of Tissues after Uncontrollable Vomiting or Diarrhœa**. It is frequently indicated in **Peritonitis** to overcome collapse, low blood-pressure, or cardiac and vasomotor weakness. Here adrenalin may be added with advantage to the normal saline. He claims that several patients owe their lives to prolonged infusion of adrenalin and saline. In other cases, unfortunately, though great improvement is obtained during the infusion, the patient soon sinks when it is stopped. Though he has often used the continuous intravenous infusion in general septic conditions, the results have not been very successful. Collargol was useless, but more recently sodium bicarbonate and soda solution have given more promising results. In pneumœnia no benefit was obtained from administering camphor.

REFERENCE.—¹*Deut. Zeits. f. Chir.* 1919, Nov., 352.

IODINE.

Seedorf¹ has investigated the action of iodine as a Disinfectant for the Skin. Test-tube experiments show that 0.1 per cent iodine in a watery solution of potassium iodide kills staphylococci in one minute, but tetanus spores require an exposure of two hours. Increasing content of iodine increases the disinfecting power; the maximum disinfecting efficiency is obtained with 1 per cent solutions. Alcohol readily kills ordinary bacteria, but has little action on spore-forming bacteria. Contrary to current views, Seedorf finds that the disinfectant action of iodine is not checked by previous application of soap and water to the skin, even though the skin was still moist when the iodine was applied. Comparative investigation of the technique of iodine sterilization revealed that different procedures were adopted in three surgical departments without apparently interfering with efficiency. Pieces of skin treated with iodine were removed during operation, and in only 42 per cent were found sterile; yet 90 per cent of the cases healed by first intention where drainage was not maintained. The septic complications were in 3 per cent abscesses in the wound, and in the remaining 7 per cent stitch abscesses. Seedorf recommends iodine disinfection, especially if preceded by mechanical cleansing. If time permits, twelve hours should elapse between the soap-and-water cleansing and the iodine application, and three iodine applications should be made in the last half-hour before operation, using 1 per cent iodine in 96 per cent alcohol. In emergencies the soap-and-water cleansing may be omitted, in order to permit repeated application of iodine.

Cheinisse² summarizes the recent literature dealing with the use of tincture of iodine in *Ophthalmic Work*. Demets, in 1911, first pointed out that iodine is well borne by the eye, and advocated tincture of iodine in *Infectious Keratitis*. Later Jacqueau found that the addition of a little iodide to the tincture improved its keeping properties and permitted dilution with water, but such collyria proved rather irritating. The best method of application was by means of a small pledget of cotton-wool round a sharpened wooden match. After cocainizing the eye the iodine is applied and found useful against infected ulceration of the cornea. Cantonnet³ also advises iodine in superficial corneal ulcerations. He uses cocaine to anæsthetize the cornea, and applies fresh iodine tincture, not over fifteen days old, preserved in a round-stoppered bottle. A drop on the end of a small glass rod is allowed to evaporate till of syrupy consistence, and this is then applied to the ulcers. As a rule an application every day or every second day is sufficient, but in grave cases two applications daily may be used. A further step has been made by Van Lint, who, in rebellious cases of corneal ulceration, advises the alternate use of yellow precipitate ointment and tincture of iodine. The plan is as follows: On the first evening yellow precipitate ointment is applied; next day it is used night and morning; on the third day tincture of iodine is applied in the morning and yellow precipitate in the evening; next day only yellow precipitate is used; and on the following day in the morning tincture of iodine is employed. To delimit the ulceration a solution of fluorescein is used, and the tincture is applied on a fine cotton pledget. He has found this treatment useful in *Ulcers with Hypopyon, Atonic Ulcers, Lymphatic Ulcers, and Lupus of the Cornea*.

According to Finck,⁴ iodine is a valuable prophylactic against, and remedy for, *Nasal Catarrh and Sore Throat*. It acts here by inhibiting the growth of the organisms. He employs a solution containing 0.3 grm. iodine in 3 grms. potassium iodide and 30 grms. water. The dosage up to ten years of age is 5 drops, for older children 8 drops, and for well-developed men 10 drops. It is given mixed with a quarter glass of water, and immediately afterwards a full glass of water is taken. He strongly advises the prophylactic use of one

dose immediately the slightest indication of nasal catarrh or sore throat is experienced, as in most cases this prevents the further development of the disease. In established nasal catarrh or angina he advises the use of the same dose twice daily, which in two or three days causes disappearance of the symptoms, but it is advisable to continue for a further ten days with a single daily dose. The cure is more rapid in thin individuals than in young children or full-blooded adults. He states that possibly the use of iodine in similar doses may prove of value in those infectious diseases which are characterized by involvement of mucous membranes—measles, influenza, small-pox, and chicken-pox. He describes an interesting group of cases where several children exposed to measles were treated with iodine, and at the end of the normal incubation period developed slight fever and catarrh of the throat, without any rash. He thinks that here the iodine may have caused the infection to take on a specially mild form.

Plesch⁵ has published a note in which he directs attention to the possible prophylactic value of iodine inhalations against **Influenza**. In a chemical laboratory where iodine vapour was constantly present, he notes that none of the workers were attacked by influenza. In discussing this article, Cheinisse⁶ utters a note of warning, and points out that the use of iodine vapour is by no means new, but was found occasionally to produce considerable irritation of the respiratory system. He himself found local application of iodine fumes to infected wounds of value. An investigation recently carried out by Luckhardt, Koch, Schroeder, and Weiland⁷ also indicates that iodine inhalation is by no means an innocuous procedure. These workers proved that iodine fumes applied to the skin are absorbed, and in dogs produce changes in the thyroid gland. Given intratracheally the fumes are readily absorbed, iodine appearing in the urine within a few hours. The thyroid contains more iodine, with corresponding histological changes. Even moderate quantities, 7 to 12 mgrms. per kilo body-weight, produce dyspnoea in the dog, and double this quantity causes death from acute pulmonary oedema, the histological changes being similar to those produced by chlorine and bromine inhalations. It is therefore inadvisable to use iodine inhalation where there is pre-existing disease of the respiratory organs.

Bird⁸ states that he has seen good results from the use of large doses of iodine in **Rheumatoid Arthritis**. He gives 1 gr. three times a day after meals the first week, 2 gr. the second, and 3 gr. the third week, gradually diminishing the dose when pain and swelling are relieved. Slight nasal catarrh may be produced. Too large doses cause diarrhoea.

Ransom⁹ thinks the active principle of the thyroid gland is a breakdown product of protein, which may be, but is not necessarily, iodized. Iodine when present has no direct effect upon the activity of the internal secretion; yet when that activity is diminished it can often be restored to a certain extent by administration of iodides. This beneficial effect may be produced in two ways: (1) The iodine may be specifically absorbed by the thyroid; (2) The iodine in the thyroid, by saturating the unsaturated fatty acids of the blood-supply, may favour the autolysis by which the active principle of the thyroid is produced. (*See also* **THYROID**.)

REFERENCES.—¹*Lancet*, 1920, i, 1231; ²*Presse méd.* 1920, July 17, 486; ³*Jour. des Prat.* 1919, Dec. 27; ⁴*Münch. med. Woch.* 1920, April 9, 426; ⁵*Deut. med. Woch.* 1920, May 6; ⁶*Presse méd.* 1920, Aug. 14, 556; ⁷*Jour. Pharmacol. and Exper. Therap.* 1920, March; ⁸*Lancet*, 1920, i, 546; ⁹*Ibid.* 1919, ii, 433.

MAGNESIUM SILICATE (Talc).

Dresch¹ recommends talc as a simple non-constipating **Antidiarrhoeic**. It is unaltered by acids, has no incompatibilities, and is apparently free from

toxic action; 200 grms. a day have been taken without ill effect. It can be given before food in teaspoonful doses washed down with water or milk. It is readily emulsified with gums.

REFERENCE.—¹*Jour. des Prat.* 1920, June 26 (abstr. in *Practitioner*, 1920, Sept., 226).

MERCUROCHROME-220.

Young, White, and Schwartz¹ have prepared a new organic mercury compound which they claim is a valuable **Urinary Antiseptic**. They postulate the requirement of a local urinary antiseptic as follows—ready penetration into tissues, lack of irritating properties, high germicidal activity, ready solubility in water and stability when in solution, absence of precipitation by urine, and low toxicity. To ensure penetration and absence of irritation, an acid in preference to a basic dye was utilized, and in dibromfluorescein a suitable substance was found in which mercury could be substituted. The resulting preparation, mercurochrome-220, is dibromoxymercury fluorescein or its sodium salt. The free acid is a red powder insoluble in water, but in sodium hydroxide solution it forms a deep cherry-red solution, with fluorescence on dilution. The solution is stable, and not affected by moderate heat. Strongly acid urine ($P_H=5.0$) causes a slight precipitation of the free dye, but acidity of $P_H=6$, or less, causes no precipitation. There is no precipitation with albumin. A 1 per cent solution is well borne by the bladder and renal pelvis. The germicidal effect is marked. A solution of 1-1000 kills *B. coli* and *Staphylococcus aureus* in urine in one minute, and is practically fifty times as actively germicidal as acriflavine in urine. Excellent results in *Cystitis* and *Pyelitis* have been obtained, and in *Gonorrhœa*, *Chaneroids*, and as a dressing for *Buboes* after incision, mercurochrome has already proved eminently satisfactory.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1919, Nov. 15, 1483.

MERCURY.

Bernhauer,¹ employing a delicate test, has investigated the effect of therapeutic doses of calomel on the kidneys, and the duration of its excretion. The method used consisted in taking up the mercury by copper dust in an acid solution; collecting and drying the copper dust; heating, to vaporize the mercury, in the distal end of a bulb tube. The mercury is deposited as an amalgam on a small particle of gold leaf. The calomel was administered in $\frac{1}{4}$ -gr. doses at fifteen-minute intervals. The total quantity varied from $\frac{1}{4}$ to 2 gr. It was found that the excretion of calomel begins within six to twelve hours, and is continued for six days, according to the dose administered. Excretion after a small dose begins as soon as after a large one, but lasts a shorter time. The greatest excretion occurs on the second day. No injurious effects on the kidney were shown by urinary examination.

REFERENCE.—¹*Amer. Jour. Med. Sci.* 1920, June, 897.

MILK. (See **PROTEIN THERAPY**.)

OVARIAN RESIDUE.

Graves¹ holds that the general ovarian tissue produces an internal secretion equal in therapeutic value to that produced in the corpus luteum. Ovarian residue preparations, after ablation of the corpus luteum, keep better than corpus luteal preparations, and have given him good clinical results in **Meno-pause Symptoms**, whether natural or post-operative. In another group of

menstrual disorders—**Amenorrhœa**, **Oligomenorrhœa**, **Delayed Menses**, and **Clotting**—a considerable measure of success was obtained. Lastly, some cases of **Dysmenorrhœa** reacted favourably.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1919, Dec., 537.

OXYGEN.

In health the arterial blood is not entirely saturated with oxygen, and in certain respiratory diseases the degree of saturation is still further diminished. Meakins,¹ using Haldane's mask, finds that both in health and in disease the degree of saturation of arterial blood can be increased by inhalation of air sufficiently enriched with oxygen. He records illustrative cases of **Lobar Pneumonia** and **Bronchitis** where inhalation of oxygen (2 litres per minute) increased the saturation of arterial blood and removed cyanosis. Rudolf² also believes that oxygen inhalations are of value in **Anoxœmia**; but the ordinary method of administering oxygen by holding a funnel connected with the cylinder near the patient's face is practically useless, as the oxygen in the alveolar air cannot be raised sufficiently by this method. A better plan is to give the oxygen through a soft rubber tube inserted into one nostril and held in place with strapping. This is a wasteful but very efficient method, and is more effectual if an attendant closes the other nostril during each inhalation. Another method is Meltzer's apparatus, consisting of a hollow tongue depressor connected with a gas-bag filled with oxygen from a cylinder. By suitable valves oxygen under pressure enters with inspiration, and during expiration oxygen flow is checked. By this method the expired air consists almost entirely of oxygen, and the amount of oxygen dissolved in the blood plasma may be increased up to seven times the normal. Rudolf recommends that oxygen should be tried in all cases of **Cyanosis**, and in acute respiratory diseases such as pneumonia when anoxœmia threatens.

REFERENCES.—¹*Brit. Med. Jour.* 1920, i, 324. ²*Amer. Jour. Med. Sci.* 1920, July, 11.

PARAFFIN-WAX BATHS.

Humphris¹ discusses the use of paraffin-wax baths in **Orthopædic Disorders** and **Local Circulatory Defects**. He uses a special thick fireclay bath, white-glazed inside, heated either electrically or with steam or gas. The best wax is Sterno¹ ozonized thermal wax with melting-point of 120° F. For orthopædic work it is necessary also to employ wax with different melting-points—e.g., 110°, 120°, and 130° F.—as nerve cases cannot stand temperatures of 130° to 135° without blistering. As a rule the part under treatment remains twenty minutes in the bath. When removed it is hot and reddened. In two or three minutes the wax adherent to the part solidifies enough to permit peeling off. The underlying skin is reddened, moist, and somewhat greasy, and in ideal condition for subsequent massage. The peeled-off wax cannot be easily freed from scales and sweat, and is best discarded. The beneficial action of the baths is apparently mainly due to local alteration in circulation, with relief of stasis and congestion, perhaps in nerve cases acting also as an insulator. The baths are useful in the treatment of stiff muscles and joints, spastic contractures from nerve injuries, and vasomotor dystrophies such as frost-bite and chilblains. He has also used them with benefit in **Neuritis**, **Scleroderma**, **Rheumatic** and **Gouty Joints**, **Fibrositis** of Smaller Joints, **Intermittent Claudication**, and **Eczema Vesiculosum**.

REFERENCE.—¹*Brit. Med. Jour.* 1920, ii, 397.

PEPSIN.

A new use for pepsin is pointed out by Unna.¹ An aqueous solution containing 2 to 5 per cent pepsin, with 0.5 per cent each of carbolic and hydrochloric acid, produces certain changes on the **Skin** which permit the ready penetra-

tion of many drugs. Each horny cell is composed of three types of albumin, which react differently to the acid pepsin. The external keratin layer is quite insoluble, but the centre of the cells consists partly of a keratin which dissolves slowly, and largely of an albumin which is readily dissolved. Under the action of pepsin applications the superficial cells of the healthy skin are thus altered. The cell cracks internally, and as the process goes on, an osmosis develops. This partial keratolytic action has been found useful in troublesome **Cicatrical Tissue**, **Keloids**, **Hyperkeratosis**, and **Phadægenic Chaneroid**. As far as the partial keratolysis facilitates the percutaneous absorption of drugs, Unna states that this holds true for most drugs except those which exert a hardening action on the skin, such as picric acid, corrosive sublimate, potassium arsenite, and potassium iodide. Patzschke² has specially studied the action of pepsin on cicatrical tissue. He uses Unna's preparation, either as a moist dressing or as an ointment containing the same proportion of pepsin and HCl. These occasionally produce slight dermatitis after several days' application, but this is easily cured by a dusting powder. In old keloids it is necessary to use a 10 per cent collodion of pyrogallic acid. The collodion is first applied, and over this a wet dressing of the pepsin solution. He has even used injections of pepsin in certain urinary diseases. Chancres which are slowly resolving under specific treatment rapidly disappear under local applications of pepsin. Another useful field is found in pathological **Hyperplasia of Lymphoid Tissue**, especially in enlarged glands whatever their nature.

REFERENCES.—¹*Berl. klin. Woch.* 1920, Jan. 26; ²*Münch. med. Woch.* 1920, April 2 (abstr. in *Presse méd.* 1920, May 22, 325).

PITUITRIN.

Jackson and Mills¹ state that the true active principle of the pituitary gland is a simple body of sympathomimetic-amine type which in the dog contracts the uterus but does not contract the bronchi. It acts on nervous elements, not on muscle. Some commercial preparations contain histamine, but this is never present in good preparations of the posterior gland.

REFERENCE.—¹*Jour. of Lab. and Clin. Med.* 1919, v, 1 (abstr. in *Surg. Gynecol. and Obst.* 1920, Feb., 109).

POTASSIUM MERCURIC IODIDE.

Macfarlan¹ considers that potassium mercuric iodide is a powerful **Germicide** exhibiting marked bactericidal efficiency in high dilutions. Organic matter diminishes its potency to a relatively slight degree. These facts, taken in consideration with its great solubility, its freedom from irritant action, and its comparatively low toxicity in the solutions efficacious for germicidal purposes, would seem to recommend this soluble double salt of the iodides of mercury and potassium as the most desirable of the inorganic germicides.

REFERENCE.—¹*Amer. Jour. Med. Sci.* 1920, April, 586.

POTASSIUM PERMANGANATE.

Neusser¹ recommends very strongly the use of this drug in **Staphylococccic Infections of the Lower Extremities**. He uses a supersaturated solution, which is applied as hot as the patient can bear it. Exposure to sun increases its efficacy.

REFERENCE.—¹*Münch. med. Woch.* 1920, Jan. 2, 17.

PRIMULA OFFICINALIS.

Joachimowitz¹ states that the dried root of the primrose yields saponin bodies which have an **Expectorant** action. He used clinically a decoction of the root sweetened with syrup. The resulting preparation is pleasant in taste.

Its expectorant action is rapidly produced, and commences within the first twelve hours. For the next two days it tends to become more marked, but ceases about the fourth day of administration. Clinically the effect is seen in increased quantity of more fluid, and less purulent, sputum. The drug can be satisfactorily used in combination with other expectorant remedies. Joachimowitz considers primrose root distinctly more effective than senega, while it is much cheaper.

REFERENCE.—¹ *Wien. klin. Woch.* 1920, July 8, 606.

PROTEIN THERAPY. (See also SERUM THERAPY.)

Non-specific Activation of Protoplasm.—Weichardt¹ holds that the parenteral introduction of foreign protein always produces a universal action on all cellular elements. No new function of any organ is produced. In an organism previously sensitized, either by infection or inoculation, this non-specific stimulation may result in a high degree of utilization of all protective processes, and may in part be shown by a well-marked local reaction in the diseased tissues. He claims that this simple explanation is gaining general acceptance. Weichardt distinguishes two types of increased function—passive and active. The passive type is only seen in the removal of paralyzing cleavage-products of metabolism, and accordingly is only found when symptoms of exhaustion are present; this passive activation never results in more than normal activity of an organ. Active activation occurs in unexhausted tissues, and may produce functional activity greater than normal. As different bodies produce somewhat different evidences of activity, he suggests the use of different types of cleavage-products of protein, but points out that the ultimate effect may be due to still further cleavage of the substances injected. He points out that physical processes—heat, light, etc.—may also lead to the formation of the necessary active cleavage-products and thus in essence be examples of protein therapy. With the increase of interest in protein therapy, commercial milk products have been marketed which are claimed to be superior to whole milk. His investigations show that whereas whole milk has anaphylactic properties, aolan, ophthalmosan, and milk casein produce no anaphylaxis. Schlittenheim² also lays stress on the fact that different varieties of protein produce different actions. Native albumin from globulin, fibrin, albumin, and nucleo-albumin groups are relatively non-toxic for single injections. On the other hand, histones and protamines are very toxic, and normally only occur in non-toxic conjugation forms, usually with nucleic acid. Amino-acids are non-toxic; so, as a rule, are low molecular peptones; but high molecular peptones and bacterial proteins are as a rule toxic. Similar results are seen in milk preparations. It has been shown that the agglutinin response in immunized animals differs for aolan, casein-peptone, and whole milk. Aolan produces a less marked agglutinin response than whole milk. Schlittenheim has found a similar difference in response in the human subject with regard to general systemic reaction. Injection of gelatin or dysenteric serum produces no immediate result, aolan only a very slight reaction; whereas milk produces a marked response, shown by fever, increased pulse-rate, and increase of local reaction in diseased tissue. All this indicates that the selection of the protein injected may be of considerable importance from the therapeutic point of view. Some observations of Weichardt³ on the effects of parenteral injection of protein in mice suffering from pneumococcus septicæmia are interesting. Protein injected intraperitoneally within eight to ten hours of the subcutaneous inoculation of the pneumococcus prolongs life, but the preliminary injection of protein twenty-four hours before inoculation had no such effect.

Peptone.—Nolf⁴ states that peptone shock is not specific for peptone, but

may be produced by the intravenous injection of many protein bodies—e.g., the serum or defibrinated blood of the patient, or his hæmolyzed red or white blood-corpuscles. The anaphylactic shock is not different from peptone shock, but only an exaggeration of it. The peptone shock is, he considers, an effort made by the organism to fix and assimilate the antigen introduced into the vein. If this assimilation takes place very slowly, and if the dose of antigen is not large, violent shock is avoided and only a mild reaction, 'peptone effect', is seen. The intravenous injection must take place very slowly, and during the entire period of injection the pulse must be carefully observed. If the pulse becomes rapid, the injection is stopped or slowed down. With these precautions, as a rule no immediate symptoms are seen except perhaps a transient tachycardia, some very deep breathing or dyspnoea, and a transitory headache. These symptoms pass off in a few minutes. After the lapse of half an hour to two hours the injection is often followed by a more or less prolonged rigor, with subsequent defervescence and profuse sweating, accompanied by a subjective sensation of amelioration and diminution in the objective signs of the disease. Nolf repeats the injection every other day. In many cases improvement is seen after one or two injections, but it is necessary to continue the injections till a complete cure is obtained to prevent a recrudescence. Clinically he has seen favourable action from peptone injections in certain Infectious Diseases, and especially in Septicæmias. He has also used it successfully in Acute Polyarticular Rheumatism and in the early stages of Non-rheumatic Arthritis. As regards the mode of action of intravenous proteosotherapy, he is inclined to the view that peptone is an easily assimilable antigen and the pathogenic microbes are antigens difficult to assimilate. Both are assimilated, after parenteral administration, by the same mechanism, and he thinks that the peptone stimulates this common mechanism, thus augmenting the destruction of the microbes.

Proteal.—Miller⁵ has used extensively partially hydrolyzed vegetable proteins in the treatment of various diseases. His preparations, called proteals, are derived from various vegetable seeds, boiled with weak hydrochloric acid, filtered, neutralized, and then standardized for nitrogen content. He finds subcutaneous use of proteals harmless, almost never producing anaphylactic symptoms, and yet of wide clinical application in all types of malady involving disturbance of metabolism or nutrition—e.g., Cancer, Tuberculosis, Arthritis, Anæmia, Hyperthyroidism, Intestinal Toxæmia, Psychoses, and Neuroses. He has elaborated a proteomorphic theory of proteal action which assumes that, parenterally introduced, vegetable protein stimulates the hæmatopoietic system. Clinical study has shown that under their use the blood becomes more normal. In anæmia the red corpuscles increase, the hæmoglobin becomes greater; the white cells often diminish in number, but show a relative increase in mononuclears. His proteomorphic theory is based on the view that the blood-cells, both white and red, liberate enzymes which play an important part in the decomposing of foreign protein.

Tweddell⁶ has found proteal injections useful in a case of relapsing Serum Sickness.

Milk.—Ryhiner⁷ obtained no therapeutic results from the subcutaneous use of milk in very young children. He tested it in many diseases—hæmorrhagic nephritis, diphtheria carriers, erysipelas, anæmia—and in attempts to activate protoplasm in the prematurely-born and others. No reaction was obtained with absolutely fresh milk approximately sterile, or breast milk. This seems to indicate that the reaction is produced by bacterial toxins or decomposition products. The reaction of the hæmatopoietic system is also much less in the very young.

Kauert⁸ also found parenteral injections of milk of no greater value than ordinary treatment in inflammatory diseases of the female internal genital organs. A marked protein reaction was seen, but the course of the disease was not materially shortened.

Schulman⁹ uses intramuscular injections of milk in Arthritis. He states that such injections are specially valuable in Gonorrhœal Arthritis, and are curative even when the urethritis remains untreated. He commences with 4 c.c., which is repeated every second day, increasing by 1 c.c. each time unless a severe reaction has been produced. As a rule not more than one week is required for gonorrhœal arthritis, and even in more chronic types of arthritis he has never had to give more than ten injections.

REFERENCES.—¹*Munch. med. Woch.* 1920, Jan. 23, 91; ²*Ibid.* 1919, Dec. 3, 1403; ³*Ibid.* 1920, Sept. 17, 1035; ⁴*Jour. Amer. Med. Assoc.* 1919, Nov. 22, 1579; ⁵*Med. Record*, 1919, Nov. 22, 825, Dec. 20, 997; ⁶*Ibid.* 1920, March 20, 487; ⁷*Cor.-Blatt. f. Schweiz. Aertze*, 1919, Sept. 4; ⁸*Munch. med. Woch.* 1919, Sept. 5, 1033; ⁹*Med. Record*, 1920, July 10, 47.

SALIGENIN.

Hirschfelder, Lundholm, and Norrgard¹ state that saligenin is the least toxic and irritant Anæsthetic of all the phenylcarbinols investigated by them. Weak solutions are devoid of anæsthetic action, but strong solutions produce a distinct dulling of sensation in mucous membranes. A freshly prepared 12 per cent solution is used.

REFERENCE.—¹*Jour. Pharmacol. and Exper. Therap.* 1920, June, 261.

SERUM THERAPY. (See also PROTEIN THERAPY.)

Dufour and Hello¹ recommend for severe Hæmorrhage the subcutaneous injection of serum of rabbits rendered anaphylactic by repeated small intravenous injections of antidiphtheritic serum. After three weeks' treatment the animal is bled and the serum collected. It is not sterilized, but a small quantity of phenol is added as a preservative. Injected subcutaneously in doses of 10 c.c. it has proved in their hands a very valuable and rapid means of arresting severe hæmorrhage. The rationale of the treatment is as follows: Anaphylactic shock is associated with increased coagulability of blood. It is impossible to produce active anaphylaxis sufficiently rapidly in urgent cases of hæmorrhage, but the injection of serum of a sensitized animal immediately sensitizes the recipient.

Czerny and Eliasberg² state that they have seen great improvement in the condition of Cachectic Tuberculous Children follow daily subcutaneous injections of horse serum. The dose varied from 0.5 c.c. to 2.0 c.c.

Shera³ records excellent results from a potent polyvalent antistreptococcal serum in a series of twenty consecutive cases of Streptococcal Infection. He used the serum either subcutaneously or intravenously. A good method is to use serum first and then follow up with vaccine. In patients who have previously had serum there is some risk of anaphylaxis. Consequently a small dose should be given as a test, and only after the lapse of several hours a larger dose administered. An unfortunate experience showed that one attack of anaphylaxis does not protect against a second.

REFERENCES.—¹*Presse méd.* 1919, Oct. 1, 553; ²*Monats. f. Kinderh.* 1920, April, 1; ³*Lancet*, 1919, ii, 909.

SOAP.

Norton¹ has re-investigated the effect of hand-washing with ordinary toilet and medicated soaps. He finds that ordinary hand-washing does not produce sterile hands, but the ordinary toilet soaps, being more efficient cleansers,

remove more bacteria than the special soaps. Thus the cleansing effect is more important than the antiseptic constituents. Soap solutions as produced in ordinary hand-washing are of no practical antiseptic value. Even soap left on the hands after washing has no germicidal value. For all practical purposes ordinary toilet soap is as efficient in removing bacteria from the skin as so-called antiseptic soaps.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1920, July 31, 302.

THYROID GLAND.

Zunz¹ has determined the iodine content of the normal human thyroid. His material was obtained from the bodies of soldiers, and the glands were removed within a few hours of death. He found that the iodine content of the two lobes does not differ greatly. For the dried gland the average content was 2.98 per cent of iodine. In the majority of cases the thyroid body contains from 1.5 to 3 mgrms. of iodine per gram of dried gland, and 0.46 to 0.84 mgrms. of iodine per gram of fresh gland. He found no relation between the iodine content and the size of the gland. Thus the total quantity in the gland varies very greatly, from 3.15 to 44.49 mgrms., the average content being 15.53 mgrms.

REFERENCE.—¹*Soc. belge de Biol.* 1919, Oct. 22.

TRANSFUSION OF BLOOD.

Zunz and Govaerts¹ have carried out an exhaustive experimental investigation into the value of transfusion of blood in various types of experimental circulatory Collapse. The results are as follows: In post-hæmorrhagic collapse the best results were obtained. In the dog, loss of two-fifths to three-fifths of the total blood induces a collapse characterized by low blood-pressure (less than 50 mm. Hg), diminution in the hæmoglobin and number of red blood-corpuscles, and reduced viscosity of the blood, which results in a lowered arterial tension with increased venous tension. Transfusion, provided it is slowly performed, is very successful even if the collapse has lasted several hours. The slow transfusion restores the blood-pressure to the normal level. If given too quickly the pressure is at first raised, but is followed by a considerable subsequent fall.

Another type of collapse can be produced by the intramuscular injection of anaerobes, which induces a progressive fall of arterial tension, accompanied by an increase in the hæmoglobin and red blood-corpuscles and an increase in the viscosity of the blood. In this type of collapse transfusion is much less efficient. A transitory rise is followed by a rapid progressive fall in blood-pressure.

REFERENCE.—¹*Bull de l'Acad. Roy. de Méd. Belge*, 1919.

TUTIN.

Tutin is obtained from a New Zealand plant, *tūtū*. Three varieties occur, and belong to the natural order *Coriariaceæ*. It is known to be highly poisonous to stock. Tutin is a glucoside obtained from the seeds. Macpherson¹ states that tutin raises blood-pressure, and in fatal quantities produces cerebral hæmorrhages. He calculates that $\frac{1}{2}$ to $\frac{1}{4}$ gr., given hypodermically, raises the blood-pressure 15 mm. within half an hour. Urinary secretion is augmented and a laxative effect is produced. It is not known how the drug leaves the body. Macpherson suggests the use of tutin: (1) As a **Cardiac Tonic** in broken compensation; (2) As a **Diuretic**; (3) As a **Purgative** or adjuvant to purgatives; (4) As a **General Tonic**. In two cases small doses, $\frac{1}{32}$ gr., promptly relieved **Asthma**.

REFERENCE.—¹*New Zealand Med. Jour.* xix, No. 89 (abstr. in *Med. Press and Circ.* 1920, i, 289).

VACCINES.

A. M. Mordy,¹ discussing the value of bacterial vaccines in immunization and therapy, comes to the following conclusions. Vaccines undoubtedly are of value in increasing resistance against the development of certain diseases. They have curative properties in some chronic conditions—**Furunculosis and Localized Abscesses, Acne Vulgaris, Colon Bacillus Pyelitis and Cystitis, Chronic Gonorrhœa and Gonorrhœal Rheumatism, Chronic Bronchitis and Bronchial Asthma of Bacterial Origin.** They have little value, if any, in infection of bone and rigid-walled cavities, intestinal tract infections, or infections of the uterus and adnexa. They are contra-indicated in acute infections and infectious diseases, acute stages of septicæmia and pyæmia, and malignant endocarditis. Before using a vaccine it is essential to make sure that the organism used is the actual cause of the disease. Immunity against the majority of bacterial diseases at best develops rather slowly, is rarely great, and is usually of short duration. Vaccine treatment is never an emergency form of treatment, and therefore should not be used during an epidemic.

Robertson² has for the past five years used vaccines with great success both as a prophylactic and curative measure in the treatment of **Chilblains**. He considers that the vasomotor paresis is associated with a real ileostasis or degree of intestinal indigestion. The local peripheral condition, he holds, is due to an absorbed intestinal toxin or to the direct action of absorbed bacteria. The lowered vitality of the tissues in the chilblain facilitates the development of surface infections. His vaccine consists of a mixture of *B. coli*, a pneumococcus obtained from the bowel, a *Staphylococcus pyogenes*, and sometimes *Streptococcus pyogenes* in addition. To prevent a serious reaction and depression the dose of *B. coli* is kept low. The original small dose is doubled and quadrupled at the end of the first and second weeks. Three or four inoculations usually overcome very severe chilblains, the effect lasting three or four months. Usually two courses are required each winter. As prophylactic treatment two inoculations at ten days' interval are given in October, and, if the patients keep free from chilblains, are repeated in February.

The same writer³ elsewhere reports the successful use of vaccine treatment in **Gynæcological and Urinary Disease**. He believes that *B. coli* vaccine in phlebitis prevents excessive clotting, and ensures readier absorption of the clot with a quicker return of the circulation. Speaking of chronic *coli* infections, he states that when a case has acquired a certain chronicity of infection it seems impossible to eradicate the bacillus; but the patient can be kept in good health by regular immunization.

Warren Crowe⁴ states that a certain measure of success has followed vaccine treatment in **Muscular Rheumatism and Fibrositis**, and good results have not infrequently been claimed in **Arthritis Deformans**. He himself has found vaccine treatment useful in primary **Neuritis**—i.e., not due to pressure or of toxic origin. The fairly high percentage of failure with vaccine treatment is due to: (1) False diagnosis; (2) Errors in bacteriology; (3) Incorrect or inefficient vaccines; (4) Faulty administration as regards dosage or interval; (5) Peculiarities in the constitution or response of the patient; (6) Mistakes in general treatment. As regards 'rheumatism', he finds four streptococci and one staphylococcus constantly recurring in the urine in severe cases. The streptococci are all of intestinal origin—two are fæcal and two are salivary, and can be distinguished from each other by their effect on neutral-red egg medium. The staphylococcus, closely allied to the *Staphylococcus epidermidis albus*, is often associated with rheumatoid arthritis and with neuritis. Though a fairly frequent contributory factor, *B. coli* is rarely the primary cause of muscular or joint pains. Though the urine apparently contains only pure

B. coli, yet, if incubated for some hours and then heated to 60° C. for varying times to kill the *B. coli*, a streptococcus can nearly always be grown. Stock vaccines are often better than a vaccine of an organism of doubtful etiological significance. The correct dose of the vaccine varies enormously in different cases. A useful check is obtained from the fluctuations in the body-weight which follow the injection. Symptomatic reactions read in relation to the daily weight chart will be found to provide an excellent guide. An excessive dose causes loss of weight lasting for a couple of days, with increase in local symptoms.

Randolph,⁵ from analysis of the records of the Walter Reed General Hospital, concludes that preventive vaccination against typhoid or small-pox may in rare instances cause the lighting up of a latent tuberculosis or streptococcal infection. In exceedingly rare instances there may be an acute and even fatal reaction of the nature of anaphylaxis.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1920, Feb. 7, 391; ²*Practitioner*, 1920, Aug., 284; ³*Edin. Med. Jour.* 1920, May, 328; ⁴*Lancet*, 1919, ii, 637; ⁵*N. Y. Med. Jour.* 1919, Sept. 13, 441.

RADIOGRAPHY, RADIO-ACTIVITY, AND ELECTROTHERAPEUTICS,

BY

CHARLES THURSTAN HOLLAND, M.R.C.S., Etc.

Lecturer on Radiology, Liverpool University ; Hon. Medical Officer, Orthopaedic, Electrical, and Radiological Departments, Liverpool Royal Infirmary.

THE most important event of 1920, from the points of view of the advancement of the status of radiography and electrotherapeutics, and of the future of these branches of medicine, has been the establishment by the University of Cambridge of a diploma. The examination requires a satisfactory knowledge of physics, especially in its bearing upon radio-activity and electricity, of *x-ray* work, of radium, and of all the methods of electrology as applied to both diagnosis and treatment. At the first examination some twenty candidates passed, and it should mean that in the future all hospital appointments in this work will necessarily be held by qualified medical men and women who also hold this, or a similar, diploma. The example of Cambridge has already been followed by Liverpool, and its University has instituted a course of instruction and a similar post-graduate diploma. These are not the only steps which have been taken to raise the standard of these branches of professional work. The University of London has established a Professorship of Radiology—a full-time post—to be held in connection with the medical school of the Middlesex Hospital. Cambridge has made Dr. Shillington Scales the Lecturer to the University. Liverpool has appointed Mr. C. Thurstan Holland to a lectureship.

The presidential address of Barclay¹ on “Ideals in Radiology and Electrology” points out the growing responsibilities of the radiologist and his work, and the possibilities of the future in view of these new developments. His remarks on the training of the radiologist should be studied, and he indicates in no uncertain manner that it is not now the duty of the expert in charge of a hospital department to take all the plates and make all the routine examinations—these can be left to assistants—but that he should be the consultant directing the work, reserving himself for special research work, for the reports issued from the department, for consultations with the other members of the hospital staff on the cases sent for examination, for the treatment of all cases, for the instruction of the students in the methods of the department, and for more advanced instruction to post-graduates.

In an address upon “War Lessons for Radiography”, Thurstan Holland,² after a criticism of War Office methods during the earlier years of the war, discusses the effects of the war on the production of apparatus and the invention of new instruments. He then shows that no great advances had been brought about in radiography from work done during the course of the war, and that even in the localization of foreign bodies nothing more had been done than to elaborate, and in some instances to simplify, pre-existing methods. The greatest effects of the war were to be found in (1) the fact that all medical

officers—that is, the bulk of the medical profession—had necessarily seen, and had impressed upon them the enormous value of, *x-ray* diagnostic work, and (2) that the lay public in the case of the numerous wounded, and the lay staffs, male and female, of war hospitals, had also had this fact brought intimately to their notice. These two facts must necessarily have a great influence on the future of *x-ray* work.

Dangers of X-ray Work.—Two disasters during the past year emphasize in no uncertain manner the accidents which may happen to both operators and patients. Dr. Jaugeas, one of the most distinguished workers in Paris, was electrocuted during an ordinary *x-ray* examination of a patient, whilst using a small high-tension transformer and an alternating current. Full details of this accident and its cause, published under the title of the “Electrocution of a Radiologist”,³ furnish much food for reflection. Additionally, the article includes a set of precautions necessary to ensure safety to operators which cannot be known too widely.

Two inquests held at St. Leonards record the deaths of two patients from poisoning who were, by a series of mischances, given *barium carbonate* instead of *barium sulphate*. In very full reports⁴ of the inquests, details of how these unfortunate men met their deaths is recorded. ‘Death from misadventure’ was the finding in both cases. If the report is correct, it appears that no qualified radiologist was in charge of the *x-ray* work at the hospital involved. (Refer to a paper by Priestley and McQuiggin⁵ in which qualitative and quantitative tests for the presence of soluble barium salts, and the presence of heavy metals, are given. It also quotes tests from Merck’s annual report for 1912). [The real point, however, as regards these salts is that none of any kind, barium or bismuth, should be given in the massive doses used for *x-ray* work unless “supplied in packages or hottles labelled and certified as pure and for *x-ray* purposes”. These are easily obtained, and there can be no excuse whatever for omitting such an obvious precaution.—C. T. H.]

X-Ray Burns.—A not inconsiderable number of *x-ray* burns occurred during the war, and with modern apparatus of high power the danger of such accidents is by no means slight. Three papers bearing on this subject should be noted: “The Cause of X-ray Burns”, by Witherbee⁶; “The Number of Radiograms and Röntgen-ray Burns”, by Witherbee⁷; “The Radical Treatment of X-ray Burns”, by Davis.⁸ The last should be useful as pointing out the different lines of treatment to be adopted in burns of various degrees of severity. The two former deal extensively with the causes of burns, how they are produced, and the means to be adopted as safeguards. A special point is made of the use of aluminium filtration when taking plates of cases.

X-RAY DIAGNOSIS.

GASTRO-INTESTINAL TRACT.

Ulcer of the Stomach and Duodenum.—Moynihan has contributed two most important papers bearing upon the value and reliability of *x-ray* examinations of these organs, and it is obvious that the examination of the stomach must include that of the duodenum. The first, on the “Diagnosis and Treatment of Chronic Gastric Ulcer”,⁹ discusses fully the symptoms of this condition, and the author expresses the opinion that the conditions usually described as gastric ulcer are in the majority of cases indications of other diseases. Clinically the most valuable symptom is that of pain, and for confirmatory evidence radiographic examination alone is more accurate than all the other additional methods of examination combined, and can positively diagnose in 90 per cent of the cases. The radiographic method is the one certain method of diagnosis,

and is now an indispensable addition to the older and far less accurate procedures. The author discusses the method of *x*-ray examination he considers satisfactory, and the value of the findings both direct and indirect. The other paper, opening a discussion on the "Treatment of Gastric Ulcer",¹⁰ also contains a large amount of material of value to the radiologist. Discussing the etiology of this condition, it is suggested that a line of inquiry worth pursuing would be the *x*-ray investigation of the alveolar processes of all suspected cases prior to the administration of the test meal. C. Mayo¹¹ considers that gastric ulcer is a comparatively rare disease, and places great reliance on the *x*-ray examination to corroborate the clinical diagnosis, and to determine whether the ulcer is gastric or duodenal; he claims that it should be successful in 95 per cent of the cases. These communications contain a considerable amount of material bearing on the much-debated question of ulcer as a pre-disposing cause of cancer, and much of this is of material value from the *x*-ray standpoint. Hurst's¹² paper on "New Views on the Pathology, Diagnosis, and Treatment of Gastric and Duodenal Ulcer" is also of radiological importance. The type of stomach in which, given the necessary exciting causes, a gastric ulcer may develop, is different from that in which a duodenal one will occur, and the opinion is expressed that a hypotonic stomach emptying slowly suggests gastric ulcer, whilst the hypertonic stomach emptying rapidly is more often found to be associated with duodenal ulcer. His method of *x*-ray examination does not materially differ from that which satisfies Moynihan. Carman¹³ contributes a paper on the "Röntgen Diagnosis of Gastric Ulcer" in which he emphasizes the necessity of a very thorough familiarity with the *x*-ray appearances of various types of normal stomachs as the first essential in diagnosis. He considers that nine-tenths of the ulcers of the stomach give distinct *x*-ray indications, and recognizes four types of gastric ulcer. In a general way, for the purposes of differential diagnosis, ulcers always project *from* the gastric contour, while in cancer the growth, and so the irregularity, extends *into* the gastric lumen. In 55 per cent of a series of 215 consecutive cases with positive gastric ulcer, a distinct residue, amounting to a quarter or more of the test-meal, is found in the stomach at the six-hour interval.

Congenital Narrowness of the Pyloric Orifice.—Maynard¹⁴ calls attention to a class of stomach cases in which there are obscure and intractable symptoms indicative of gastric derangement, and at the operation he has not been able to account for the condition found except on the ground that the pyloric orifice is too small to allow of a free and easy exit of the gastric contents. He considers that an *x*-ray examination should assist in the accurate diagnosis of this condition, especially if the meal takes an unduly long time to pass out of the stomach and there is some irregularity in the shape of the part in the neighbourhood of the obstruction. In these cases the history and symptoms would have to coincide with the *x*-ray findings.

X-ray Examinations of the Digestive Tract.—Watkins¹⁵ reports on the pathological findings in 1000 cases which he tabulates. He insists very strongly that no such thing as a so-called *x*-ray diagnosis should be either demanded or expected; if the best use of an *x*-ray examination is to be made, then it should be looked upon as a consultative examination in which a full knowledge of the clinical history and symptoms is correlated with what is demonstrated by means of radiology. The paper is of value as indicating in a large number of cases the approximate frequency with which different pathological conditions are met; and in advocating a very complete examination as a routine, attention is called to a group, 95 in number, in which more than a single pathological lesion was present at the same time.

Operability of Cancer of the Stomach.—Carman,¹⁶ in discussing this question as determined by *x* rays, divides the cases into three main groups—operable tumours located at the pyloric end, border-line tumours which extend so far up the stomach that the possibility of their resection becomes uncertain, and the group of gastric tumours in which the cardiac end of the stomach is involved and which are quite inoperable. He states that 70 per cent of all gastric cancers occur at the pyloric end, but that the question of malignancy, whilst of importance in considering the advisability of operation, is of no importance from the standpoint of the possibility of operation: the latter depends merely upon the amount of healthy stomach wall that remains. Even when pronouncing, from the *x*-ray point of view, that a lesion is operable, this must necessarily apply to the stomach only, as perforation and metastasis almost invariably remain undiscovered until revealed by the knife.

Diagnosis of the Nervous Disorders of the Stomach and Intestine.—In opening a discussion on this question Hurst¹⁷ contributes much that is of value to the radiologist, especially as regards nervous dyspepsia, atonic dilatation, hyperchlorhydria, hypochlorhydria, hysterical vomiting, aerophagy, constipation, and so on. In the discussion following there is also much that bears on the subject from the radiological standpoint.

Diaphragmatic Hernia.—McMillan¹⁸ reports three cases he found in American soldiers, all through the left side. In one the hernia was stomach only, in another stomach and splenic flexure; both followed on wounds. In the third the condition followed on an empyema (pneumonic), and was discovered accidentally in making an *x*-ray examination of the chest; in this case the splenic flexure was also in the thorax. Absence of any symptoms in two of the cases was striking. Belden¹⁹ reports a further case following on a gunshot wound of the left chest. He refers to many papers on the subject. Howk and Herring,²⁰ in making a routine *x*-ray examination of the chest, discovered a partial left-sided hernia of the stomach in a man not presenting any definite symptoms, and in whom the history suggested that the condition had gradually supervened after a blow on the abdomen more than twenty-five years previously. A still more interesting case is reported by Keith²¹ in which the hernia was through the right diaphragm. This was a male, age 17, in whom symptoms of stomach trouble had been present since he was eighteen months old—intermittent attacks of vomiting, with loss of weight. The case was undoubtedly congenital. The diagnosis was an *x*-ray one, and it was confirmed by the operation. All these papers are profusely illustrated, and show the varying *x*-ray appearances well, some immediately after the meal, others at varying intervals after the same, and in the last case the condition after operation and cure. This last case is the first in which a right-sided diaphragmatic hernia has been demonstrated by *x* rays.

Tetanus.—The radiological appearances of the stomach in tetanus have been observed by Siciliano,²² who has been able to examine a few cases. The result of his examinations showed that the shape of the organ was normal in each case, that the tone was good, but that diminished, or absolute loss of, peristaltic movements was characteristic in all the cases. Nevertheless, in all except one the stomach emptied within the normal time.

Polyp of the Stomach.—Ruggles²³ reports an unusual example of this rare condition. *X*-ray examination showed a defect along the greater curvature involving a quarter of its extent, constant in all positions, and with no delay of emptying. Both clinically and from the *x*-ray standpoint the case suggested carcinoma. The bibliography is given.

Models of the Human Stomach under Various Conditions.—Barelay's²⁴ paper is instructive. He begins by contrasting *x*-ray findings with descriptive

anatomy, and shows very clearly in tabular form that the level of the diaphragm as recorded by anatomists deriving their knowledge from the dead subject is altogether unreliable as a guide to its level during life and as proved by radiography. The author has made models to scale of a number of stomachs showing typical conditions, and these models are based upon the *x*-ray findings, and not made from any one subject. They are of life size, and show the organ in different positions and under different circumstances of food-supply, also the normal and abnormal stomach. It is suggested that they will be of use for teaching purposes.

Radiology in Chronic Intestinal Stasis.—Jordan,²⁵ in a further contribution on this subject, whilst reiterating his well-known views, adds the results of his further experiences. Ileal stasis can be produced in at least five different ways: by Lanc's ileal kink, the controlling appendix, the dropped cæcum with ileal torsion, colitis with spasm at the ileocæcal entrance, and the congenital inverted cæcum with the terminal ileum retroperitoneal. The results are the same in all cases; they can all be demonstrated radiographically, and the latter is the deciding factor as to operation or other means of treatment.

X rays and the Appendix.—This is the title of a paper by Bennett²⁶ in which the diagnostic value of the examination is discussed in full. The author is of opinion that the *x*-ray examination should be made under more normal conditions than is usual, and suggests that no preliminary purge should be given, and that the opaque salt should be mixed with the ordinary food, i.e., spread over the foods which form the usual breakfast. The screen findings and the plates are discussed, and findings in some fifty consecutive cases compared. Not much stress is laid upon the visualization of the appendix, and the statement is made that in no case has the visibility or invisibility of the appendix had the slightest influence in deciding for or against operation.

Tuberculosis of the Stomach.—An interesting case is reported by Geuken.²⁷ Two radiographs showing an hour-glass condition do not exhibit any special feature which would point to the actual cause. At the operation, in addition to actual tuberculous deposit in the middle of the lesser curvature, a hard string of tuberculous tissue was found compressing the stomach.

Ulcerative Tuberculous Colitis.—Brown and Sampson²⁸ have a lengthy and well-illustrated paper on early *x*-ray diagnosis. The technique is discussed under the two headings of the barium meal and the barium enema. In all, 175 cases came under observation, with 44 positive, 32 doubtful, and 99 negative results, and complete tables are furnished of all the cases. The conclusions arrived at are that, whilst the fluoroscopic examination is essential, plates must also be taken; that the *x*-ray method has enabled a diagnosis to be made positively in many cases where it would have remained uncertain otherwise; that the *x*-ray diagnostic criteria are filling defects and hypermobility.

Gall-stones.—Rowlands,²⁹ in a clinical lecture on gall-stones, refers shortly to the value of *x*-ray diagnosis as follows: "It is unfortunate that it does not often show gall-stones; even with the greatest care in the examination and a good apparatus, only *large* gall-stones or a large collection of small stones are shown by the *x* rays. This fact is important, as many people are led to believe that they have no gall-stones if the *x* rays do not show any". [Loose general statements of this kind are to be deplored. With regard to the last statement, no radiologist of repute would fail to warn both patients and their doctors that the negative evidence is unreliable. In my own experience with gall-stone cases I have frequently been able to show quite small stones, and these small stones are not infrequently very opaque to *x* rays. My cases include one in which three small stones were present, and the diagnosis was entirely a positive *x*-ray one; one stone did not show, and the larger of two

others weighed 1.2 gr. It is generally conceded now that, with proper technique, gall-stones should be shown when present and looked for in at any rate 40 per cent of the cases.—C. T. H.]

THORAX.

Diamond's³⁰ contribution on the x-ray diagnosis of diseases of the thoracic viscera is comprehensive and well illustrated, and is an admirable summary of the present position of x-ray diagnosis as regards the lungs and heart. It is essentially a paper which should be most useful to the general practitioner, as indicating the various conditions in which an x-ray examination is either diagnostic in itself, or is a great aid to correct diagnosis. Typical radiographs show very clearly the different appearances due to different diseases. The part dealing with the heart is especially good, and the radiographs, mostly taken with parallel rays at a distance of 6 feet, are marked with white lines which indicate the important diagnostic shadow measurements.

Non-opaque Foreign Bodies in the Bronchi.—Jackson, Spencer, and Manges³¹ publish a very important paper on their diagnosis and localization; some papers have appeared previously on this subject, but this article contains original work. The radiographical part of the paper is by Manges, who points out that it is the *early* x-ray signs which are the important ones, as in the later stages, when consolidation, abscess formation, etc., are present and demonstrable, the condition of the patient is so serious that x-ray findings are not of the same importance. The characteristic x-ray signs are: (1) *Increased* translucency over the entire affected side; (2) Depression of the diaphragm on the affected side; (3) Displacement of the heart and mediastinal structures *away from* the affected side. The reasons for these x-ray findings are set forth clearly, and many cases are reported and illustrated with most convincing radiographs. It is interesting to know, as most of these cases are in children, that the x-ray technique is simple, and that respiratory movements do not prevent the three cardinal signs showing distinctly.

Influenzal Pneumonia.—A very complete series of observations—clinical and x-ray—are reported by Harvey and Selby³² in a paper based on observations of over 2000 cases of influenza with over 600 of pneumonia. The whole subject is fully dealt with, and the x-ray findings in 260 cases are recorded. Many of them were x-rayed daily, immediately after the onset of the influenzal attack and before any indications of pulmonary involvement. The cases could be classified into three main groups: (1) Mild unilateral confined to one lobe; (2) Mild bilateral confined to two or more lobes; (3) More severe cases. It was noticed that in a small percentage the physical signs did not correspond with the x-ray facts, and that in some cases there was x-ray evidence two or three days before any physical signs. In addition to describing the immediate x-ray signs, the paper goes on to discuss various points in the sequelae and complications, and amongst other findings two are interesting; in analyzing 78 hæmorrhagic pneumonias without complications, 19 showed physical signs after the x-ray had become negative, and 44 showed x-ray signs after the physical signs had disappeared.

Serofibrinous Pleuritis.—The results, radiographic and otherwise, following immediately or remotely, are described by Péhu and Daguët³³ in a paper based on the examination of 123 patients who had had a pleural effusion. They were examined radioscopically at intervals from six weeks to twenty-five years after the acute phase, and are classified, as regards the results, into four groups. The results of evacuation and non-evacuation of the fluid are compared, and the authors conclude that the results obtained by puncture in serofibrinous pleuritis are not favourable.

Heart.—Cohn³⁴ has made a study of the *size of the heart* in soldiers by the tele-Röntgen method. American infantrymen were chosen who had been subjected to privation and exertion, and the size of the heart estimated by a method described in the paper, points being made of the facts that the men were breathing normally during the course of the examination, the exposures were not more than a fraction of a second, and the phase of respiration during which the exposure was made was automatically recorded by means of a special device. The conclusions arrived at, amongst others, were that in normal breathing the difference in the size of the heart during inspiration and expiration may be neglected; and that the soldiers' hearts examined under the conditions stated are not larger than those of normal individuals.

An *x-ray study of the aviator's heart under conditions simulating high altitudes* has been made by Le Wald and Turrell.³⁵ Those interested should study this research paper, which is illustrated with photographs of apparatus, many radiographs, kymograph tracings, charts, etc. The research was made in order to determine whether cardiac enlargement does actually occur at high altitudes, and the lower-pressure chamber and the Henderson rebreather were used in two series of studies. The authors conclude that their measurements might represent an enlargement due to flying at high altitudes, but they are more inclined to the opinion that they represented the undamaged heart of the athlete, from which class most aviators were drawn.

The radiographic findings in *pericarditis with effusion* by Holmes³⁶ record the results of experiments on the determination of the appearances of the heart shadow when the heart was immersed in fluids of varying specific gravities; of experiments to demonstrate the change in the cardiac outline resulting from the injection of ascitic fluid into the pericardial sac of a living dog; of experiments on dead human subjects; and of the data obtained from the examination of living cases, in five of which it was known by tapping that fluid was in fact present. His findings are that in this condition *x* rays show an abnormally-shaped heart shadow which changes with change of the position of the patient, obliteration of the normal heart outline, and change in shape of the angle formed by the posterior border of the heart, diaphragm, and spine.

A reference³⁷ to the literature, chiefly French, regarding *foreign bodies in the heart and vessels* mentions that Borreau³⁸ considers there is a difficulty in deciding by means of *x* rays whether a foreign body is actually in the heart or not; and a case is reported in which apparently a clear space could be seen between the shadow of a piece of shell and the heart itself, and yet at the operation the fragment was embedded in the posterior wall of the left ventricle. Robineau³⁹ considers that if the foreign body is actually in the heart, then the character of the movements is swift, with a large amplitude, and a brusqueness similar to that of the cardiac contractions, and that these are diagnostic.

BONES.

Many references to the rarer bone abnormalities show the need of remembering their *x-ray* appearances. Especially in cases of injury this knowledge becomes of paramount importance. In any case which is in the least degree doubtful, a comparison with the sound side should be made, if error is to be avoided. Pirie (see MEDICAL ANNUAL, 1920, p. 24) has described a *new ossicle between the upper surfaces of the astragalus and scaphoid*, and suggested its importance in cases of injury. *Plate I* shows Pirie's ossicle in the foot of a woman who had also had a definite injury of the os calcis; the other foot was radiographed and showed a similar ossicle: it should be noted that these abnormalities are usually present on both sides.

PLATE I.

PIRIE'S OSSICLE



An accessory bone between the astragalus and scaphoid present in both feet.

C. Thurstan Holland.

PLATE II.

THE BONE OF VESALIUS: AT THE BASE OF THE FIFTH METATARSAL



MEDICAL JOURNAL, 1921

C. Thurston Holland.

PLATE III.

KÖHLER'S DISEASE OF THE SCAPHOID

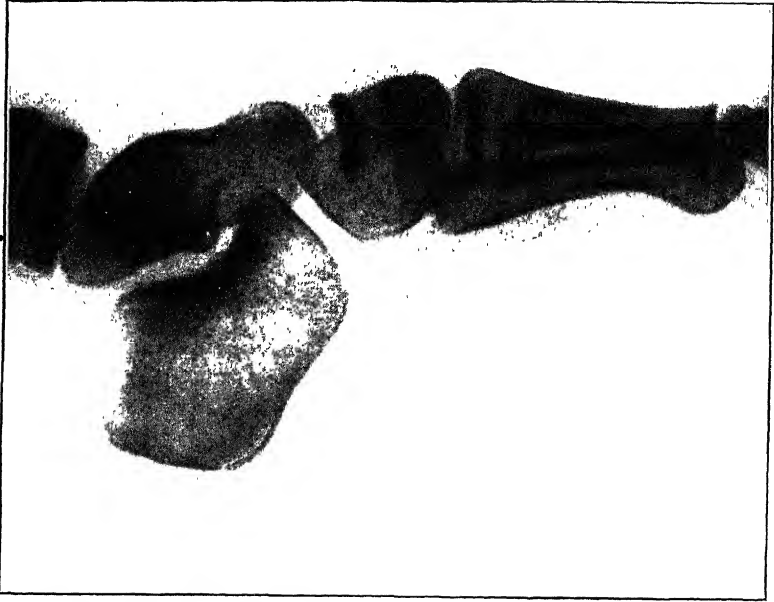


Fig. A.—The affected foot.

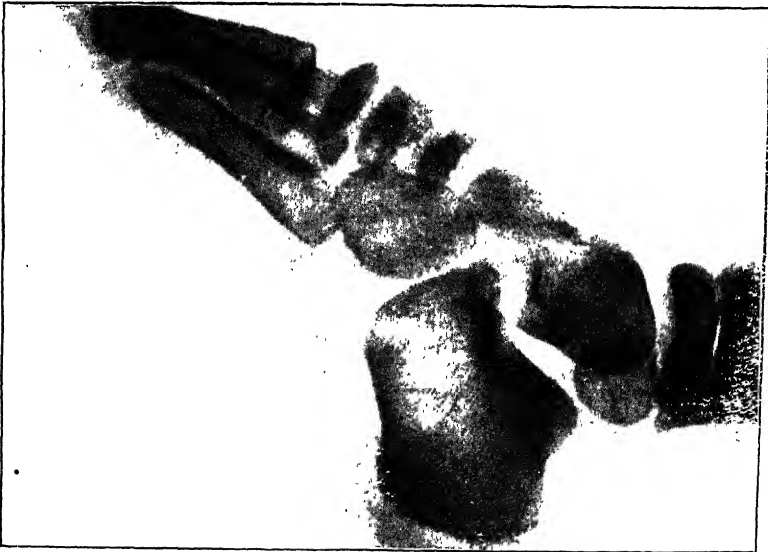


Fig. B.—Normal foot. Same case.

C. Thurston Holland.

PLATE IV.

ABNORMALITY OF OSSIFICATION IN BONES OF HANDS



•
7
•
7
6

•

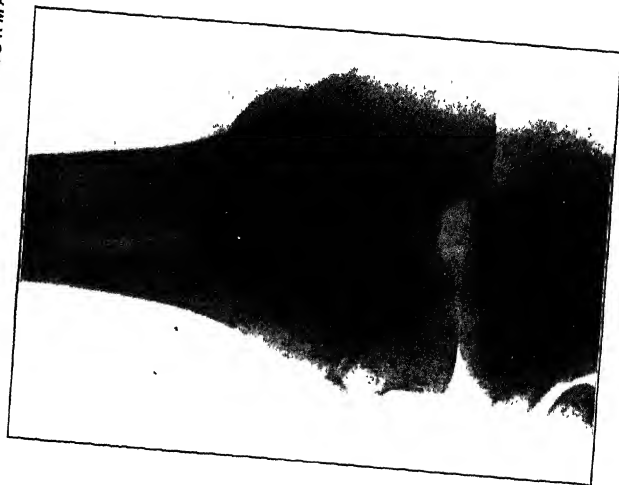
•

1
 2
 3
 4
 5
 6
 7
 8

4
5

PLATE V.

ABNORMALITY OF PATELLÆ



Left knee.



Right knee.

C. Thurstan Holland.

I have met with five cases recently in which a radiograph showed an *extra piece of bone at the base of the fifth metatarsal*. Plate II shows this bone—the bone of Vesalius. In each case there was a history of a recent accident involving the foot, and in each case a radiograph of the other (sound) foot showed exactly the same abnormality. It would be very easy to make a mistake in diagnosis if the injured foot only were examined. This bone (or epiphysis more probably) would possibly be shown more frequently if radiographs of the foot were taken—as was this one—with the outer edge of the foot raised 25 degrees from the plate; in the more usual sole-flat-down position, in some of the cases it is not shown. A similar bone—also known as the bone of Vesalius—is said to occur at the base of the fifth metacarpal: I have never seen it.

Köhler's Disease of the Scaphoid Bone of the Foot.—This is a rare disease first described in 1898, the pathology of which is not certain, and is described by O'Brien,⁴⁰ who publishes a description of a case and gives the short literature.

I have recently seen two cases. Plate III shows the x-ray appearances of the affected and the normal feet in one of these cases. Arrest of ossification and increased density of the already ossified centre of the bone are the salient x-ray features. The cases recover entirely under simple rest treatment.

A rare abnormality of ossification in the bones of the hands is shown in Plate IV, the two hands of a child 10 years of age with webbed fingers of the right hand. In addition to deformities of phalanges on the right side, it should be noticed that the thumb and index metacarpals have epiphyses at either end in each hand, and that many of the phalanges of the deformed hand also show these double epiphyses. This is an exceedingly rare condition.

Schlatter's Disease of the Tuberosity of the Tibia.—Scales⁴¹ describes, with radiographs, two cases in both of which there was no history of any injury. He considers it to be less rare than is usually supposed.

Mouchet⁴² describes a very rare abnormality of the patella in a child 14 years of age. The condition is one in which the radiographs show what appears to be an epiphysis, analogous to that seen about the anterior tuberosity of the tibia and that at the posterior surface of the os calcis. This again, if it persisted in adult life, might easily cause an error in diagnosis in a traumatic knee. The scanty literature is referred to. I came across one such case in 1920 in a child suffering from rickets and knock-knees. Plate V shows the two knees, and the abnormality affecting the outer and upper borders of both patellæ.

Legg's Disease.—Under the title of *osteochondral trophopathy of the hip-joint*, Reiley⁴³ reports four cases, with a series of radiographs. This disease is far more common than is usually known, and even in these x-ray days is frequently mistaken for tuberculous disease. The x-ray appearances are: the epiphysis of the head of the femur is flattened and broadened, and its ossifying centre is distorted and often segmented; the epiphyseal cartilage is irregular in outline; the neck of the femur is broad and short, with possibly a lessened angle; the acetabulum is often irregular. The correct differential diagnosis can only be made by an x-ray examination. See also a paper by Ely.⁴⁴

Multiple Exostoses.—Keith's⁴⁵ research on the structural alterations in the disorder known by this term is based on the examination of radiographs of several cases. He suggests a new explanation of this disease, for which reference must be made to the paper, and concludes that it is a definite disorder of growth and should be named 'diaphyseal aclasis' in order to indicate its real nature—he suspects that it may be due to a disturbance of the functions of the glands of internal secretion, probably the thyroid.

Metastatic Malignancy of the Bones.—Moore⁴⁶ has made an x-ray study in a series of 65 cases of malignant disease of various parts, and concludes that, although bone metastases may result from malignancy anywhere, the most common foci are the breast and prostate. Two types are described: (1) The osteoclastic, characterized by an extreme decrease in x-ray density, the bone appearing honeycombed, most common as secondary to malignant disease of the breast; (2) The osteoplastic, characterized by an irregular increase in bone density, most common in carcinoma of the prostate.

Myxochondrosarcoma of the Femur.—Cotton and McCleary⁴⁷ illustrate with radiographs and photographs the report on a case, and compare their findings with a previous case of myxoma of the same bone. A full history of this case right up to the death of the patient is given, with the x-ray appearances at different times, descriptions of the blood examinations, and of the pathological examinations of the tissue removed.

Radiography in Artificial Pneumoperitoneum.—Hyman,⁴⁸ in a paper on this subject, commences with references to its early history and literature. He considers that the condition, *par excellence*, for this method of diagnosis lies in that group of cases complicated by ascites; and also that the combination of the opaque meal and the intraperitoneal injection of oxygen gives very disappointing results, and that each method should be used separately. It should be recommended especially for the study of pathological conditions of the liver, spleen, and kidneys. Stein and Stewart⁴⁹ furnish the results of their later experience of this method of examination in a second paper. They have further simplified the technique, and this is explained in detail, whilst the entire absence of danger is emphasized. This paper is illustrated by numerous radiographs which show the advantages of pneumoperitoneum in making the diagnosis more accurate. Its indications and contra-indications are discussed; in its present stage the method should be reserved for the elucidation of diagnostic problems which have baffled the ingenuity of the clinician.

Radiographic Rarities.—Florence Stoney⁵⁰ reports two cases which may be so termed, but both emphasize in an unmistakable manner the necessity for x-ray examinations. In one a soldier suffered from chronic asthma. An x-ray examination showed a tracheotomy tube low down in the trachea. He remembered nothing at all about it, but it transpired that when two years of age he had suffered from bronchial croup. The removal of the tube brought about cure of his asthma. In the other case a lunatic soldier was much worried at the loss of his watch. Half in joke he was taken to the x-ray department. The missing watch was discovered in his œsophagus at the level of the upper end of the sternum. (See also CEREBRAL TUMOURS, RADIUM TREATMENT OF).

REFERENCES.—¹*Proc. Roy. Soc. Med. (Electrother. Sect.)*, 1919, 1; ²*Ibid.* 1920, 57, and *Brit. Med. Jour.* 1920, i, 353; ³*Arch. of Radiol. and Electrotherap.* 1920, Jan., 267; ⁴*Pharmaceutical Jour.* 1920, 211; ⁵*Med. Jour. of Australia*, 1919, 383; ⁶*Med. Record*, July 1920, 183; ⁷*Amer. Jour. Med. Sci.* 1920, Aug., 184; ⁸*Ann. of Surg.* 1920, Aug., 224; ⁹*Brit. Med. Jour.* 1919, ii, 765; ¹⁰*Ibid.* 1920, ii, 99; ¹¹*Ibid.* 1920, ii, 103; ¹²*Ibid.* i, 559; ¹³*Surg. Gynecol. and Obst.* 1919, Dec., 432; ¹⁴*Brit. Med. Jour.* 1920, i, 626; ¹⁵*Amer. Jour. Roentgenol.* 1920, May, 234; ¹⁶*Jour. Amer. Med. Assoc.* 1919, Nov.; ¹⁷*Brit. Med. Jour.* 1920, ii, 499; ¹⁸*Amer. Jour. Roentgenol.* 1920, March, 143; ¹⁹*Ibid.* May, 250; ²⁰*Ibid.* 247; ²¹*Ibid.* June, 289; ²²*La Radiol. Méd.* 1919, 97; and *Arch. of Radiol. and Electrotherap.* 1920, March, 336; ²³*Amer. Jour. Roentgenol.* 1920, July, 356; ²⁴*Jour. of Anat.* liv, 1920; ²⁵*Lancet*, 1920, i, 756; ²⁶*Brit. Med. Jour.* 1920, ii, 316; ²⁷*Arch. of Radiol. and Electrotherap.* 1920, April, 354; ²⁸*Amer. Jour. Roentgenol.* 1919, Dec., 625; ²⁹*Brit. Med. Jour.* 1920, i, 605; ³⁰*Med. Record*, 1919, Nov., 873; ³¹*Amer. Jour. Roentgenol.* 1920, June, 277; ³²*Ibid.* Feb.-March, 109, 148; ³³*Rev. de Méd.* 1919, 101; ³⁴*Arch. of Internal Med.* 1920, May, and *Amer. Jour. Roentgenol.* 1920, July, 368; ³⁵*Amer. Jour. Roentgenol.* 1920, Feb., 67; ³⁶*Ibid.* Jan., 7; ³⁷*Brit. Med. Jour. (Epitome)*, 1920, ii, 26;

³³*Bull. et Mém. Soc. de Chir.*, 1919, March; ³⁴*Ibid.*; ³⁵*Boston Med. and Surg. Jour.* 1919, Jan., 445; ³⁶*Arch. of Radiol. and Electrotherap.* 1920, May, 396; ³⁷*Bull. et Mém. Soc. Anat. de Paris*, 1919, Nov., 452; ³⁸*Amer. Jour. Roentgenol.* 1920, July, 347; ³⁹*Ibid.* 1919, June, 296; ⁴⁰*Jour. of Anat.* 1920, liv, and *Brit. Med. Jour.* 1919, ii, 847; ⁴¹*Amer. Jour. Roentgenol.* 1919, Dec., 589; ⁴²*Ibid.* 594; ⁴³*Med. Record*, 1920, 100; ⁴⁴*Jour. Amer. Med. Assoc.* 1920, July, 7; ⁴⁵*Arch. of Radiol. and Electrotherap.* 1920, April, 352.

RADIOTHERAPY.

Mottram and Clarke¹ have investigated the *leucocytic blood-content of those handling radium for therapeutic purposes*, and the results are interesting and suggestive both for radium and x-ray workers. They found a definite leucopenia in both laboratory and clinical workers which did not appear to be associated with any condition of ill health. Details of the research describe the exact conditions found, the results of the taking of holidays, and the methods by which an attempt was made to estimate the daily amount of irradiation to which the clinical workers were subject; the latter showed that every ten weeks a worker received the same quantity as a patient undergoing treatment for cancer of the breast. Further details of these observations are to be found in the Report of the London Radium Institute for 1919, and it is stated that it appears necessary for the maintenance of the general bodily health that those who habitually work with, or are brought much into contact with, radium, should be given at least two days' holiday per week. All workers' blood should be examined at monthly intervals, and if any indication of leucopenia or anemia of marked degree is detected, this should indicate a holiday of from one to three months. Menstrual function in female workers should also be taken note of. The report deals very fully with apparatus, screening, technique, the reactions and nature of the reactions, sequelæ, exposures, and protection, in addition to the actual treatment of cases. **Carcinoma of the Cervix and Uterus, Carcinoma of the Mouth and Pharynx, and Carcinoma of the Rectum** form an important part of the report, and the latest methods and their results promise much in the future. All the various conditions suitable for radium treatment are commented upon, and altogether this report is most valuable and should be studied by all medical practitioners.

In the Report of the Manchester Radium Institute of 1919 Burrows draws special attention to the more modern methods of treatment in **Cancer of the Mouth**. He has followed the American plan, and describes the technique in full; essentially this consists in burying in the growths unscreened emanation tubes and making no effort to recover them. A number of typical cases are quoted, with the results obtained, and these are so much better that the treatment is considered to be full of promise. A useful part of this report is that dealing with the apparatus for drawing off, and preparing, the emanation; this is illustrated by a number of photographs of the apparatus, of which a full description is added.

In a long and well-illustrated article Failla² describes the *radium technique* at the Memorial Hospital of New York. This again gives very full details of the preparation of the emanation, and of a machine with which 100 tubes can be made in less than two minutes by simply turning a crank. Apparatus devised for **Radium Treatment of the Mouth, Uterus, and Bladder**, all very ingenious, is illustrated, and the methods of application are fully described. All radium workers will find the information contained in this paper of much practical value.

Janeway,³ of the same hospital, in a paper on the **Treatment of Uterine Cancer**, reviews the opinions of, and results obtained by, a large number of well-known workers, and reports on his own cases. The value of this paper

is to be found largely in his review of the work already published, which is so concisely summed up that the methods and results are easily contrasted. The author is of opinion that the treatment of early cases of cancer of the cervix by radium is fully justified; whilst his observations on the same method of treatment for cancer of the uterus itself are worthy of special attention.

Radium in Gynecology.—A large number of papers on this subject have appeared of late, and many will repay a careful study. Perhaps the following are the most useful. Boggs⁴ discusses radium in the treatment of **Cancer of the Cervix and Uterus**, and quotes many authorities; his views generally are in accord with modern advanced work. Pancoast⁵ includes the uses of α rays in a communication on the same subject, but does not consider that α -ray treatment alone is a strictly rational measure in dealing with uterine carcinoma; he suggests that radium, which is more local in its action, should be followed by α rays, which will cover a wider area. Rouffart⁶ prefers operative measures, but considers radium a useful adjunct which in inoperable cases may considerably prolong life. He lays stress upon the extreme caution necessary in the application of radium prior to operation.

Meyer⁷ discusses generally the question of Röntgen therapy in gynecology, and demonstrates admirably the lines of its application, its limits, and the necessity for skilled, and not promiscuous, use of either radium or α rays. He also lays great stress upon the co-operation of the radiologist and the surgeon. Field's⁸ dissertation on radium in regard to its present status as surgery's adjunct, whilst including uterine conditions, covers the whole ground of surgical diseases in which the question of the use of radium may arise. He lays special stress on lymphosarcoma, tuberculous glands, and fibroids of the uterus, being the three conditions in which treatment by radium is the method of choice.

Béclère⁹ publishes the results obtained by α -ray treatment in 400 cases of **Uterine Fibroids**, giving tabulated results and statistics, and the technique employed. The latter is simple, and weekly small doses are preferred to monthly and intensive radiation. The therapeutic results, and the mode of action of the treatment, both on the fibroids themselves and on the ovaries, are fully discussed, and the author believes that, apart from certain conditions which imperatively call for surgical interference, radiotherapy is applicable to all uterine fibroids. In cases of **Menorrhagia** a satisfactory result is almost always possible of achievement. Knox¹⁰ enters into the whole question of the radiation treatment of uterine fibroids, and he discusses the history of the treatment, and describes the technique, the mode of action, and dosage, contrasting α rays and radium. This paper also contrasts the advantages and disadvantages of α -ray treatment, deals with the immediate and later effects, points out the dangers, and concludes with a description of the type of cases suitable. Following this are papers on the same subject by Williamson, Martindale, and Lockyer, and reports of the opinions of a number of other workers.

A further paper on **Menorrhagia**, based on the results obtained in 600 cases by the use of radium, is published by Stacy,¹¹ and the dosage fully gone into; it is of interest to note that older patients are started off with larger doses than younger ones. In discussing the pros and cons for this treatment, and in considering the cases in which it should not be used, it is definitely laid down that radium is the ideal treatment for this complaint in patients more than thirty-five years of age who have a fibrous type of uterus, and also in those who have menorrhagia associated with the presence of small fibroids.

Hernaman-Johnson's¹² paper on α rays in the treatment of certain forms of **Dysmenorrhœa** is largely a plea for their more extensive use in this condi-

tion. He describes the characteristics of a suitable case, states and discusses the objections to this method of treatment, points out the effects on the skin and the dangers of faulty technique, and quotes the essential details of a few cases.

In a critical review, Young¹³ takes up the whole subject of α rays and radium in gynaecological practice from the point of view of the gynaecologist only. The chief part of this paper is devoted to cancer and fibromyomata, other conditions being dismissed in a few words. A large number of references are made to the writings of well-known observers in various parts of the world. Altogether a paper well worth the consideration of radiologists.

An interesting and thoughtful paper by Boggs¹⁴ on **Lethal and Erythema Dosage of Radium in Malignancy** raises many points of great importance. He considers that the lethal dose in this form of treatment is a matter of the utmost consequence at the present time, and that this dose should always be the aim of the operator. One point the author advocates is that, before burying radium needles in the substance of a growth, in view of the possibility of this method tending to the spread of metastases, a surface application of radium for two weeks previously should be made.

Stevenson's¹⁵ work on the uses of radium in certain conditions supervening upon **War Injuries** is well known, and he adds a further paper on the effects of radium on war injuries in the neighbourhood of Nerves, giving the details of some twelve cases. A striking result is shown in the rapidity with which a certain amount of improvement follows on the application, not only as regards the relief of pain and tenderness, but in the almost immediate increase in movements in the stiffened joints.

Actinomyces has been treated with radium by Heyerdahl,¹⁶ and he reports six cases in which the results were most satisfactory, complete cure being obtained in at any rate four of them. Full details of the cases and of the technique employed are given. In all the disease had attacked the face or the neck.

In **Oriental Sore**, Tomkinson,¹⁷ who had previously reported good results from α -ray treatment, has had further opportunities of dealing with this disease, and reports two other cases in which the causative bodies, *Leishmania tropica*, were found. One case was entirely successful, and the other considerably improved and was still under treatment. Comparatively few, and small, doses are required. Whilst reporting favourably on this line of treatment, the author considers that further careful investigation is required. (See KALA-AZAR.)

Forschbach¹⁸ has treated a case of **Polycythemia** for an exceptionally long time with α rays. The diagnosis was the hypertonic form of erythrocythemia rubra, with 6,000,000 erythrocytes. The treatment extended on and off for over two years, and consisted of deep irradiation of the long bones, the number of exposures and the rests between (of which details are given) depending upon a careful observation of the red- and white-cell-counts. Treatment was discontinued when the red-cell-count was 4,796,000 and the hæmoglobin 90 per cent. Care must be used to avoid a leucopenia, the premonitory lowering of the white-cell-count being an indication to lengthen the intervals between irradiations.

Radium has been used in a case of **Glioma Retinæ** by Schoenburg.¹⁹ This disease is one in which the outlook is so bad that any treatment, which can hold out possibilities of relief must not be overlooked. One eye in this case had been removed for a growth which proved to be typical. The other eye was affected, and radium treatment brought about considerable benefit and reduction, at any rate, in the size of the growth.

A very complete account of *Acne Vulgaris*, including a description of the pathology and histology, is given by Semon²⁰ in discussing the treatment by x rays. He makes general remarks on the treatment, enters minutely into the x -ray dosage, fully describes the methods of application, and gives the reasons for varying the methods of administration according to the actual condition of the acne. A point insisted upon is that no grease in any form should be applied during the course of radiotherapy. The important conclusions arrived at are that there are no permanent contra-indications to x -ray treatment, that cure is the invariable result and can only be obtained by judicious irradiations, that in the nodular and keloid varieties nothing else will either ameliorate or cure, and that relapses are rare.

In the treatment of *Pruritus Ani* Young²¹ depends entirely upon fractional doses of x rays given at weekly intervals; the doses are unfiltered, and the amount and number required varies. Stress is laid upon the importance of working in conjunction with a proctologist, as the cause of the pruritus is so often due to some kind of rectal pathology; but even in cases where there is this causation-pathology, radiation may be successful in controlling the itching. [In some of these cases the results of even as few as one or two exposures to x rays are so striking that, even if the itching is not entirely stopped, a life of misery is turned into one of complete comfort. I have had experience of three such results in the past two years.—C. T. H.]

Webster²² has tried x rays in the treatment of an early case of *Acromegaly*, and considers that it is a disease which, theoretically, should, especially in the early stages, be suitable for this method of treatment. He gives a full account of the patient on whom he tried x rays, describes the methods adopted, and in commenting on the result, etc., quotes several authors. The immediate result was remarkable: severe headache, relieved at first, soon disappeared altogether; irritability and depression almost vanished; the optic disc became normal, and the fields of vision greatly enlarged. The treatment was stopped. Two years later the condition had again become aggravated, and she went to operation.

A paper by Heublein²³ on radium therapy in *Enlarged Thymus Glands* in infants is illustrated by a series of radiographs showing the thorax both before and after treatment, in all of which there is very evident diminution in the size of the area of shadow in the upper mediastinum. The author has treated in all forty-one cases, and considers that the condition, as revealed by x -ray examination, is much more common than is usually supposed. The technique is fully explained: 200 mgrms. of radium element are applied over four areas on the anterior chest wall, filtered through 0.3 mm. of silver, at half an inch distance from the skin, for one hour in each place. Emphasis is laid on the point that in these small infants radium has great advantages over x rays, as its application is simple and does not frighten the child.

Molyneux²⁴ reports favourably upon the treatment of *Tuberculous Adenitis* by radium, and considers that, if properly used, it is a safe and certain cure whether for an early or advanced case. He has treated from twenty to thirty cases, and in every one swellings and even old sinuses faded away. Details of the method—only 15 mgrms. of radium bromide were used—are given, and illustrative cases related. Many of the patients were inspected some years later, and in none had there been any recurrence.

Some observations by Vilvandr ²⁵ on the x -ray treatment of *Neoplasms*, based chiefly on cases of inoperable *Sarcoma*, but including other malignant conditions, are of interest. Two cases of sarcoma of the tonsil are striking. One in which treatment commenced in 1915 was perfectly well, with no signs of growth, in 1920; the other started in 1911, joined the army in 1914, and

was still well in the middle of 1916. The author enters into a discussion on the reasons of success in some cases and failure in others, and draws a parallel between x rays and arsenic which raises many interesting points.

Hernaman-Johnson,²⁶ in dealing with the use of x rays as **Immunity-raising Agents before and after Operations for Cancer**, states his opinion that before operation a peculiarly favourable opportunity is presented for treatment by radiation. This paper is based upon the opinion that by both radium and x rays it is possible to increase the patient's resistance to cancer, and the suggestion is made that before long it may be possible, by using blood-tests as criteria, to gauge scientifically the dosage to be given at each sitting. It has been verified experimentally that small doses of x rays raise the immunity to cancer, whereas larger ones decrease or abolish it, and that at the present time the difficulty is to decide upon the correct methods of dosage.

In a paper dealing with the rôle of radium in the treatment of **Malignant Disease of the Bladder and Male Genital Organs**, Morson,²⁷ after references to the action of radium on normal tissues, and to sepsis in relation to radium irradiation, describes his own methods and results in the treatment of malignant growths of the bladder, prostate, penis, and testicle. He describes four different methods for applying radium in bladder conditions, states his reasons in selecting cases, and refers to the results which may be expected.

The treatment of **Exophthalmic Goitre** is the subject of a paper by Burrows and Morison²⁸ in which the results obtained by radium and x rays are contrasted. The technique of either form of treatment, as carried out by the authors, is described in full detail. The different features of the disease, the manner in which they react to treatment, the etiology, and prognosis all come under discussion, and the authors conclude that there is no evidence that any treatment gives such safe, uniform, and promising results as irradiation of the thyroid gland.

Finzi,²⁹ in his report to the Fifth International Congress of Surgery, Paris, 1920, brings up to date the whole of our knowledge upon the treatment of **Tumours** by radium and x rays. This is a long and full report, admirably presented and arranged; nothing of importance appears to have been omitted; it contains an enormous amount of information, and should be of the utmost value for reference. He sums up the position in a terse final sentence in which he urges most strongly that *inoperable* is no longer synonymous with *incurable*.

REFERENCES.—¹*Arch. of Radiol. and Electrotherap.* 1920, April, 345; ²*Ibid.* June, 3; ³*Ibid.* May, 373; ⁴*Amer. Jour. Roentgenol.* 1920, April, 202; ⁵*Ibid.* March, 146; ⁶*Ibid.* 1919, Nov., 1477, and *Rev. Mém. de Gynéc. et d'Obst.* Paris, 1919, July, 241; ⁷*N. Y. Med. Jour.* 1920, 143; ⁸*Arch. of Radiol. and Electrotherap.* 1920, Jan., 254; ⁹*Arch. of Radiol. and Electrotherap.* 1920, Jan., 254; ¹⁰*Brit. Med. Jour.* 1920, ii, 535; ¹¹*Amer. Jour. Roentgenol.* 1920, Aug., 379; ¹²*Lancet*, 1919, ii, 432; ¹³*Edin. Med. Jour.* 1920, 47; ¹⁴*Amer. Jour. Roentgenol.* 1920, Aug., 398, and *N. Y. Med. Jour.* 1920, 1013; ¹⁵*Brit. Med. Jour.* 1920, i, 862; ¹⁶*Jour. Amer. Med. Assoc.* 1920, 1928; ¹⁷*Brit. Med. Jour.* 1920, ii, 397; ¹⁸*Berl. klin. Woch.* 1919, 1034, and *Jour. Amer. Med. Assoc.* 1920, 771; ¹⁹*Arch. of Ophthalmol.* 1919, Sept., and *Brit. Med. Jour.* 1919, ii, 719; ²⁰*Brit. Med. Jour.* 1920, i, 706; ²¹*Amer. Jour. Roentgenol.* 1920, Feb., 116; ²²*Arch. Radiol. and Electrotherap.* 1920, Jan., 261; ²³*Amer. Jour. Roentgenol.* 1920, April, 191; ²⁴*Erit. Med. Jour.* 1919, ii, 7; ²⁵*Ibid.* 1920, i, 215; ²⁶*Ibid.* 793; ²⁷*Brit. Jour. Surg.* 1920, July, 36; ²⁸*Proc. Roy. Soc. Med.* (Electrother. Sect.), 1920, July, 132; ²⁹*Brit. Jour. Surg.* 1920, July, 68.

ELECTROTHERAPEUTICS.

Agnes Savill¹ publishes "Reflections on Medical Electricity" which are well worthy of consideration. Pointing out the effects of the war, and the startling success of electrotherapeutics as seen in military hospitals, she goes on to warn the profession and the general public against the present-day tendency to allow the details of treatment to be decided, and carried out, by

masseuses and other unqualified assistants, and this without proper expert supervision. Two cases of neuritis are related to establish her contention, and the whole paper is a plea for the necessity of the teaching of medical electrical methods as a subject of the medical curriculum, and for the direction and supervision of all such treatment by duly qualified experts. Sloan,² in "Notes on Recent Cases of Electrotherapy", considers that there is a large field open to those who will practise this special branch of therapeutics in combination with other methods, though many cases can be cured by electrical methods alone. His quoted cases, which include *Mucocolitis*, *Alopecia*, *Brain Injury*, *Locomotor Ataxia*, *Tic Douloureux*, amongst others, are graphically pictured and instructive.

Nævi.—The whole question of the treatment of nævi in children is discussed by Milani,³ who starts with a description of all the various kinds, and the suggested line of treatment for each. Of all the methods the author considers electrolysis by the bipolar method the best, and he advocates the use of the Lewis-Jones bipolar platino-iridium needles and a current of 40 to 60 ma. for from 30 to 60 seconds. The needles should be 10 to 12 mm. distant from one another, and should be withdrawn when discoloration appears at the site of puncture; no second application should be made for eight days at least.

Ionization.—Baker Young⁴ gives an account of his experiences in the treatment of *Septic War Wounds* by means of ionization with a solution of sodium chloride, in which good results are recorded. The first part of his paper is an account of three laboratory experiments, which appeared to prove (1) that electrolysis with this salt will inhibit the growth of *Staphylococcus aureus* and *albus*, and (2) that phagocytosis is stimulated by a small current passed for a short time. Cases are related, and the chief conclusion arrived at was that cases of cellulitis showed a marked improvement, both in relief of symptoms and in final results, and that cicatricial contractions were practically unseen.

Electricity in Nerve and Muscle Injuries.—Three papers and a discussion on (1) "The Place of Electricity in the Diagnosis and Treatment of Nerve Injuries," by Souttar;⁵ (2) "The Value of Electrical Testing of Nerves at Operation", by Burke;⁶ and (3) "Condenser Tests in the Diagnosis and Prognosis of Nerve Injuries", by Worster-Drought,⁷ raise many points, and should be valuable to those interested in these questions. The first enters largely into a discussion of the methods of action of massage and electricity in the treatment of paralyzed muscles, and criticizes some of the more generally held views. Burke gives the results he obtained in testing eighty cases, describes the apparatus he used and its methods of application, and states the conclusions arrived at. Worster-Drought bases his observations on the experience he obtained from 2000 cases of nerve injury of the upper and lower limbs, and his remarks are intended to illustrate the value of condenser tests in helping to arrive at an opinion as to the extent of a nerve lesion, the nature of the treatment to be recommended, and the ultimate prognosis. A paper by Cooper⁸ also deals with the question of the treatment of muscles by artificial stimulation. Commencing with a consideration of the class of injury, the author goes on to consider the cause of muscular atrophy and its prevention and cure, the treatment, both preventive and restorative, massage, contractions produced by means of electrical stimulation, the considerations in the selection of appropriate currents, the question of fatigue, etc. He concludes with a summary. This paper is long and full of very interesting material.

Diathermy.—Several papers on diathermy are worthy of consideration. Patterson⁹ considers that in *Cancer of the Buccopharyngeal Cavity* it ought entirely to supersede cutting operations, and that it is remarkable in this country that there is so little appreciation of its value. He describes and illus-

trates his apparatus and technique, and claims that it is not only in advanced cases that he advocates its use, as he sums up his opinion in the following words: "It is the best method in *all* cases, and not only in borderland ones. No excision of a carcinomatous growth in the tongue, mouth, or pharynx, however small that growth may be, should be carried out with the knife if diathermy is available". Cumberbatch¹⁰ has carried out a number of experiments in order to test the elevation of the body temperature by the diathermy current, and the path of the current in the body, and describes these experiments, the results obtained, and the conclusions they lead to. The chief point investigated was the rise of temperature which took place in parts distant from the actual place at which the current was applied, and the manner in which the current flowed and effected these heating properties. One result arrived at, therefore, was that an indication was obtained as to the position in which to place the electrodes when it is wished to apply diathermy for medical purposes, either to the whole body or to a region of it. There is a large amount of practical information to be got by a study of this communication.

Ultra-violet Rays.—Bordier's¹¹ paper deals with the question of establishing a method to control the dosage and to create a unit of quantity based on weight. The unit of quantity he obtains from the property possessed by ultra-violet rays of reducing salts of silver; and he takes it at that quantity of these rays which, acting normally on a decinormal solution of silver nitrate 1 cm. in thickness, can reduce 1 mgrm. of silver per square centimetre. Taking this as the unit, he has devised a chromo-actinometer, made by impregnating strips of paper with a 20 per cent solution of potassium ferrocyanide. Ultra-violet rays will turn this from initial white to deeper and deeper yellow, and the depth of colour can be controlled by five standard tints. The main theses of McCaskey's¹² paper on "Quartz Ultra-violet Therapy and Kinetic Energy" are two: one to suggest how to co-ordinate and raise the index of the patient's kinetic drive, or so-called metabolic efficiency; the other to reveal a specific function which quartz ultra-violet light can be made to play in establishing a healthier degree of metabolic equilibrium. He enters into both with a considerable amount of interesting detail, utilizing the work of others as an aid in establishing his points. Finally, he lays down a series of axiomatic rules which should govern any attempt to utilize this light in metabolic disorders.

Electricity and the Ductless Glands.—De Kraft¹³ has investigated the action of electrical currents on the ductless glands and other tissues in a paper which covers a vast amount of ground. He considers that very little attention has been paid to the possibility of stimulating the action of glands of internal secretion by means of electrical currents, and puts forward the work of others, in addition to observations he has himself made, in order to establish his case.

REFERENCES.—¹*Med. Press*, 1919, 228; ²*Arch. of Radiol. and Electrotherap.* 1920, April, 357; ³*Riv. Osped.* 1920, Feb. (abst. in *Brit. Med. Jour.* (Epitome), 1920, ii, 2); ⁴*Lancet*, 1919, ii, 529; ⁵*Brit. Med. Jour.* 1920, ii, 387; ⁶*Ibid.* 388; ⁷*Ibid.* 389; ⁸*Lancet*, 1919, ii, 1067; ⁹*Ibid.* 1020; ¹⁰*Arch. of Radiol. and Electrotherap.* 1919, Nov., 173; ¹¹*Ibid.* 1920, April, 366; ¹²*N. Y. Med. Jour.* 1919, Dec., 1058; ¹³*Med. Record*, 1920, 136.

Part II.—The Dictionary of Treatment.

A REVIEW OF MEDICAL AND SURGICAL PROGRESS FOR 1920, BY MANY CONTRIBUTORS.

ABDOMINAL SURGERY. (*See also* APPENDIX; GALL-BLADDER AND BILE-PASSAGES; HERNIA; INTESTINES; PANCREAS.)

E. Wyllys Andrews, A.M., M.D., F.A.C.S.

Treatment of 'Acute Abdomen' (see also APPENDIX).—Saint¹ reports several cases of acute abdominal disease which were treated expectantly by him, and several others submitted to operation which later appeared unwarranted. He urges that we should abandon hard-and-fast rules as to the treatment of the so-called acute surgical abdomen. [In the reviewer's opinion, the current teaching on this subject is all too radical. From a study of the text-books and most of the literature on the subject, one would get the impression that in all cases presenting the picture of acute abdominal pain, fever, vomiting, leucocytosis, and tympanites, it is little short of criminal not to operate immediately. This teaching is in a way justified, because of the urgency of making the general practitioner realize the danger of waiting in the great majority of such cases. It is time now, however, to realize that a certain percentage of them can safely be treated expectantly, and the operation done at a more favourable time, or even avoided entirely. There should be instituted in such cases a most rigid management. Total abstention from food and drink, absolute rest in bed, with hot applications to the abdomen, free use of morphine, and proctoclysis are indicated. Under this treatment a great many infections of the appendix, gall-bladder, tubes, and ovaries will become well localized, and can be safely operated later. Also many a partial obstruction of the bowel will open up, and can be cured by an operation when there is no crisis.—E. W. A.] Deaver² is of the same opinion, but warns us of the great difficulty in deciding if a case falls under the above category, or if it is a perforation of the bowel or stomach or some other condition which does not tend to localize. In his opinion the history is the most important factor in these conditions.

Pseudomyxoma Peritonei.—Seelig³ reports a case of this interesting disorder in a male, and discusses the subject. In the male the condition arises from the rupture of a pseudomucinous cyst of the appendix. In the female it may originate in the ovary. The pathology of this condition is unique. With the gelatinous material there also escape from the appendix some epithelial cells which give rise to secondary tumour formation very closely resembling malignancy. However, histologically these growths are benign, and present only the picture of a few delicate fibrils growing into the material and a few apparently normal epithelial cells. The results of a rupture of such an appendix are given as follows:—

The course of events following the escape of the pseudomucin varies.

1. The exudate may be limited in its escape to the right iliac fossa, where it constitutes itself as a saucer-like, kidney-like, or sausage-like mass, that is slowly encapsulated by connective-tissue growth. The connective-tissue growth tends from the outset to infiltrate into the mass as tiny tendrils, which grow into well-developed strands later. The mass of pseudomucin is usually coursed with fine blood-vessels and frequently peppered with small hemorrhages. The connective-tissue capsule tends to establish firm adhesion to the neighbouring peritoneum.

2. The exudate may not be localized to the right iliac fossa, but may escape to various and multiple intraperitoneal sites, setting up the typical peritoneal productive reaction which results in loculation of the pseudomucin into cyst-like cavities, to which neighbouring peritonealized structures become adherent. Sometimes, in this form of spread, the pseudomucin becomes delicately encapsulated and hangs from the intestinal peritoneum as little polypi.

3. It is possible for the exudate to be absorbed entirely—Lejars reports such instances, and the writer has under observation at present a patient who in all probability is absorbing a pseudomyxomatous mass.

4. There may be wide dissemination of the exudate, with a tendency to marked secreting activity on the part of the disseminated material. These are the cases that present the clinical appearances of an ascitic abdomen, with accompanying symptoms of cachexia and general physical deterioration. In this group we may encounter infiltration of the abdominal wall. In spite of all these earmarks of malignancy, there is clear-cut clinical evidence of the benign nature of this type of the disease in several instances. In other recorded cases, this type of the disease has carried patients off exactly as does widespread intra-abdominal carcinosis. In these cases, where the dissemination is widespread, there is an accompanying adhesive peritonitis which tends to bind and fuse all the intra-abdominal organs into an inseparable mass. Kinking of the intestine and consequent intestinal obstruction is naturally a likely complication.

Splenectomy in Rats.—Morris and Bullock⁴ point out that most of the former experiments on the effect of splenectomy on animals have been done with insufficient numbers of animals or else have not been properly controlled. The mortality of animals in a laboratory is normally very great, and this as a rule has not been taken into consideration. In their experiments about 400 rats were used. One-half of these were used as controls and one testicle was removed, an operation of about equal severity in the rat. The mortality among the splenectomized rats, both after injection of micro-organisms and those exposed to chance infection, was far greater. In one series of 88 rats of each kind, exposed to an epidemic of rat plague, 85 per cent of the splenectomized rats succumbed in three weeks, but only 29 per cent of the controls.

Abdominal Reflexes.—Williams⁵ has made a very careful study of the abdominal reflexes in a number of abdominal affections. The results are very contradictory, and he concludes that they can be of little clinical value. He notes that the most frequent picture is a loss of the local reflex over the area diseased, and thinks that this fact may be of some importance. The mechanism probably is that in the first stages the reflex is exaggerated, but later becomes diminished or lost from fatigue.

REFERENCES.—¹*Lancet*, 1920, i, 795; ²*Surg. Gynecol. and Obst.* 1920, Jan., 20; ³*Ibid.* June, 570; ⁴*Ann. of Surg.* 1919, Nov., 513; ⁵*Brit. Jour. Surg.* 1920, Jan., 320.

ACHYLIA GASTRICA. Acidum Hydrochloricum recommended for (*see p. 1*):
Bitters (*p. 6*).

ACNE VULGARIS. (*See also SKIN, GENERAL THERAPEUTICS OF; VACCINES, p. 22.*) *E. Graham Little, M.D., F.R.C.P.*

Semon¹ prefers X-ray treatment to any other in all stages of acne, which he differentiates into three grades: (1) Comedo formation; (2) Comedo with pustulation; (3) Nodular deep infections.

In *Stage 1*, in which only mild surface-action of x rays is required, a filter is not used. A tube of medium hardness, working at a spark-gap of between four and five inches, is the best for the purpose. A visible erythema—the so-called ‘reaction’—should not be aimed at; nor is it necessary to produce subjective sensations of itching or heat. The dose must be controlled in every case by the change of colour of a reliable make of the Sabouraud-Nqiré pastille, which should be accurately placed at a point exactly equal to half the distance between the anticathode of the tube and the surface irradiated. It is also of the utmost importance that the trajectory of the rays should make a right angle with the plane on which they fall. As the areas usually affected by acne (except in the case of the back and chest) are relatively curved, and not plane surfaces, this direction can only be approximately followed in most cases. The summit of the curve will obviously be the nearest point to the anticathode; and it follows that the measurement of the distance from the anticathode, which should not be less than 6 in., must be made from the centre of this area. For a case of uncomplicated comedo formation a dose approximating to four-fifths of the full epilation dose (or B tint) is generally sufficient to effect a marked improvement. The administration is usually given in two sessions, with an interval of five days between them. In some cases the activity of the sebaceous glands is not effectively damped down by four-fifths of the pastille, and another two-fifths or three-fifths of the full dose may be required. In all cases ten days must be allowed to elapse after the primary four-fifths B dose has been administered. If this precaution is rigorously adhered to there is no risk of overdosage. The appearance of an erythema is the signal for cessation of x -ray application to that particular area; the final effect of the treatment cannot be accurately gauged until all reaction has passed away. A cure can be anticipated in the majority of the cases in which it has occurred; for slight and invisible cutaneous atrophy, in which the sebaceous glands particularly are implicated, will ensue. It is again emphasized that the atrophy of the sebaceous gland is neither physiologically desirable nor a factor in the treatment. Inhibition of an excessive activity is all that is required to cause involution of the comedo. In every case of facial acne treated by x rays the eyebrows, eyelashes, and mucous membranes must be effectively protected by strips of malleable lead foil, which can be fixed *in situ* by rubber strapping.

In *Stage 2*, when pustulation and dermatitis are marked, an effort should first be made to allay them by the application of mild antiseptic and detergent lotions of lead, calamine, or mercury oxycyanide (1–4000). A few days later the areas can be treated by x rays. Two-fifths of the B tint can be given at intervals of ten days, and repeated as found necessary. ‘Erythema reaction’ should be carefully avoided in the pustular stage.

While there are conceivable alternatives to radiotherapy in (1) and (2), the presence of intradermic and subdermic nodules and cold abscesses, periglandular fibrosis, and keloidal tissue (*Stage 3*) is a direct indication for x -ray treatment; by no other agency can their involution be permanently achieved. The deeper situation of all these lesions calls naturally for the use of harder or more penetrating rays. These can be obtained in two ways: either (a) by the use of a ‘hard’ tube, with a spark-gap working at a distance of 5 to 6 in., or (b) by interposing a screen of sheet aluminium, which cuts out the soft

erythema-producing rays altogether. The filter should have a thickness of 0.5 mm., and with this in position a full pastille dose (tint B) may be given at the first session without risk. (The pastille holder must be used on the proximal side of the screen.) Considerable improvement will usually be noticed in ten days or a fortnight, and filtered half-pastille doses may be repeated at this interval until involution is complete. The use of a filter will prevent or delay the development of erythema reaction, and in most cases a satisfactory result will have been obtained before this develops. (*See also p. 36.*)

REFERENCE.—¹*Brit. Med. Jour.* 1920, i, 706.

ACOUSTIC TUMOURS. (*See CRANIAL SURGERY; EAR, INNER.*)

ACRODERMATITIS CHRONICA ATROPHICANS.

E. Graham Little, M.D., F.R.C.P.

Scholtz¹ contributes a very full report of a case of extensive atrophy of the skin, which is probably to be classed under the heading in the text. The patient was a Russian Jew, age 44, showing large areas of atrophy succeeding a prolonged stage of redness and oedematous infiltration. It commenced on the lower extremities, and spread upwards to the level of the inguinal region. Above this level to the waist line there was a dusky redness, but as yet no atrophy. On the upper extremities the hyperæmic zone started with the hands on both sides, and ended with the lower third of the arm. The palms were unaffected. The backs of the hands showed extreme degrees of the 'cigarette-paper' wrinkled atrophy of the skin. No histological investigations were possible, but the author considers that the condition could be differentiated from scleroderma. Treatment is useless.

REFERENCE.—¹*Arch. of Dermatol. and Syph.* 1920, May, 565.

ACROMEGALY. For X-ray treatment of, *see p. 36.*

ACTINOMYCOSIS. Treatment by Radium therapy (*p. 35*).

ADENITIS, TUBERCULOUS. Radiotherapy useful (*p. 36*).

ALCOHOL AND INDUSTRIAL CONDITIONS. (*See INDUSTRIAL HEALTH.*)

ALOPECIA. (*See also SKIN, GENERAL THERAPEUTICS OF.*) *E. Graham Little, M.D., F.R.C.P.*

Passot¹ recommends the very audacious manœuvre of Transplantation of a Portion of the Scalp furnished with Hair from the temporo-occipital region, where baldness is uncommon, to the centre of the bare scalp, where the hair thus provided may be ultimately trained over the neighbouring bald areas and so achieve a desirable cosmetic effect. The operative measures are described in full detail, and are too long to abstract. Some idea of the procedure may be obtained from the diagram annexed (*Fig. 1*).

Fuhs² has conducted some experiments with the preparation 'Humagsolan,' a hydrolysed keratin which was reported by Zuntz to have a remarkable property of promoting growth of hair in the human being and in sheep. In

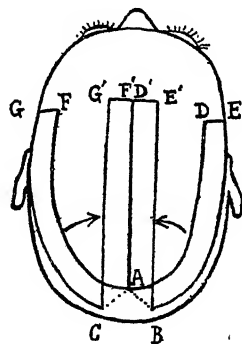


Fig. 1.—Transplantation of portion of hairy scalp. The flap ABDE, cut out from the hairy temporo-occipital region, is brought over to the median line, in the centre of the scalp, in the position ABD'E'. Should this be insufficient, there is placed beside it, three weeks later, the flap ACFG, which is brought over to ACF'G'.

the latter experiment Zuntz claimed that sheep treated with this preparation showed in two-and-a-half months an increase of more than one-third of wool. Fuhs has repeated the experiments in seventeen patients with alopecia areata with negative results, with eight patients with seborrhœic alopecia, and also in healthy individuals, as Zuntz had done, and can find no confirmation of his favourable report on this preparation.

REFERENCES.—¹*Presse méd.* 1920, April 17, 222; ²*Wien. klin. Woch.* 1920, Aug. 5, 707.

AMAUROTIC FAMILY IDIOCY.

Frederick Langmead, M.D., F.R.C.P.

As J. Epstein¹ points out, this rare disease of early infancy is chiefly characterized by an early deterioration of body and mind, blindness, and death. It affects exclusively Jews, usually of Russian or Polish parentage, and in many cases more than one child in a family is affected.

PATHOLOGY.—This is fairly definite: the condition is a disease of the central nervous system, essentially degenerative in type, in which the nerve-cells of cortex, cerebellum, and cord all take part.

SYMPTOMATOLOGY.—Epstein outlines the main symptoms. An apparently



Fig. 2.—An amaurotic family idiot, 10 months old.
(Retraced from the 'Medical Record'.)

normal healthy baby begins at about the age of six months to show evidences of general backwardness. The normal development of infancy ceases, and the baby loses the power to hold up its head, and cannot sit up or carry out properly the usual motor functions of early life. It becomes oblivious to its surroundings, and its face assumes a dull, vacant, aimless, idiotic expression. As a result of optic atrophy and degeneration of the retinal ganglia, the power of vision is gradually lost; there is formed a peculiar cherry-red spot in the region of the macula lutea and fovea centralis of each eye. Hearing, as a rule, becomes hyperacute. During the early stages there is general muscular weakness, with slight flaccidity or spasticity of the extremities, and a diminution or increase of reflexes. Nutrition is usually good. During the later course of the disease, vision is quite lost, and there is marked spasticity, with increase in reflexes and general or local spasms. The child wastes, and lies in a helpless condition until death.

DIAGNOSIS.—Confusion has arisen in connection with a type of progressive cerebral degeneration which occurs in older children, and is also accompanied by blindness and ends fatally. Though there is pigmentation in the region of the macula, the cherry-red spot is absent. This variety of amaurotic cerebral degeneration is not confined to Jews. As the late F. E. Batten pointed out, it has often been erroneously included in the description of true infantile amaurotic idiocy originally described by Tay. [Epstein also draws this distinction, but speaks of the condition of progressive cerebral degeneration in older children as the juvenile type of amaurotic idiocy, a nomenclature which, in our opinion, were better avoided.—F. L.]

Five cases of the infantile disease are reported by Epstein, and they present some points of interest. All were the children of parents apparently

healthy in body and mind, and young, or at least of middle age. They all came from the same social and economic class, one that knew no privation, and led a clean life with clean habits. Pregnancy, birth, and lactation were normal in all cases. They all had the same peculiar and characteristic facies. The voice had a certain vibrating nasal quality, due probably to paresis of the soft palate. In all the disease passed through the same cycle of events with almost monotonous uniformity, and eventually all met the same fate. (See Fig. 2.)

REFERENCE.—¹*Med. Record*, 1920, Feb. 7, 224.

AMŒBIASIS.

Sir Leonard Rogers, M.D., F.R.S.

ETIOLOGY.—P. A. Buxton¹ has carried out extensive observations regarding the rôle of the house-fly as a carrier of *E. histolytica* infection in Mesopotamia. He obtained microscopical evidence of the presence of faecal matter, probably nearly always human in origin, in no less than 63 per cent of the flies he dissected, while in 4 per cent human intestinal parasites and in 0.3 per cent *E. histolytica* cysts were identified. Female flies showed 65 per cent of faecal contaminations. The percentage was lowest, 39 per cent, near British troops' fly-proof-seated latrines with no incinerators, but as high as 71 per cent if incinerators were also present; which ought also to be protected against flies. Arab compounds showed 80 per cent of contaminated flies. *E. histolytica* cysts are difficult to identify in the faeces of flies, so the above figure doubtless underestimates their true occurrence. He concludes that the fly may be regarded as an actual and major factor in the carriage of the common bowel disorders of Mesopotamia.

A. H. Haig² records notes on the microscopical diagnosis of amœbic dysentery, and describes and figures the causative parasite, *E. histolytica*. He agrees with the common view that enclosed red corpuscles are diagnostic of the pathogenic variety, and that iodine staining is necessary for the recognition of its four nucleated cysts, the discovery of which in a stool may be an important aid in the diagnosis of liver abscess.

J. C. Watt³ records tests of the viability of the cysts of amœba and other protozoa in faecal matter subjected to drying and exposure to the sun. He questions the correctness of Wenyon and O'Connor's conclusion that taking up eosin stain is a proof of the death of such cysts, and thinks that hardening of the cyst-wall by drying may prevent the entry of the stain as formalin apparently does. He obtained signs of life in cysts of amœbæ and other organisms after complete desiccation of faecal matter containing them for two months, and also diarrhoea and living organisms in a chicken fed on this dried material. These experiments support his view that dust may be an important carrier of intestinal protozoal parasites, including those of amœbic dysentery, especially in Africa, where the disease becomes less with the onset of the rains and disappearance of dust from the air.

K. M. Lynch⁴ describes and illustrates the penetration of the base of the gland crypts of the large-intestine mucous membrane by dysenteric amœbæ, and their spread into the submucous coat.

MEDICAL TREATMENT.—F. G. Haughwout, P. T. Lantin, and M. A. Asuzano⁵ report on a trial of 10 to 20 drops of a 20 per cent alcoholic solution of Benzyl Benzoate in eight cases of amœbic dysentery, and state that it greatly relieved the symptoms and lessened the peristalsis of the bowel and the number of the stools, without doing any harm, and they believe it to be a useful drug, although they could not follow up their cases to see the after-results. They are doubtful about using it in bacillary dysentery on account of its constipating action, but think it will be advantageous in place of morphine in relieving pain, etc.

SURGICAL TREATMENT IN DYSENTERY.—Z. Cope⁶ deals with the surgical aspect of dysentery in his Hunterian Lecture, having had an extensive experience in Mesopotamia and collected the experience of other workers. After mentioning the simulation by dysentery of cancer of the bowel and appendicitis, he goes on to refer to the surgical complications of dysenteric lesions of the bowel wall. Perforation is less common than might be expected, and most commonly affects the cæcum and the sigmoid. It is generally amœbic in causation, with such a friable, acutely inflamed, and œdematous wall that these cases are very unsuitable for operative measures, while they may recover under medical treatment, a post-colic abscess having sometimes to be opened later. He only knew of two successful operations for dysenteric perforation, both by C. C. Choyce. Next he deals with acute œdematous localized colitis, usually a typhlitis, which he and others have had to regret operating on in mistake for appendicitis, a mistake which Rogers had warned against. Choyce had also saved several cases from this mistake, and Emetine should be first given a good trial in them. Dysenteric affection of the appendix does also occur, but seldom requires operative procedures, as it subsides with proper treatment of the causative dysentery.

The surgical treatment of chronic dysentery with very extensive ulceration, producing the colon pus-sac, offers better prospects, after a full trial of medicinal treatment has failed; while Cotte has recorded five recoveries in seven Appendicostomies with irrigation with 1-1000 silver nitrate solution in the acute stage between the fifteenth and twentieth day of the disease. Cope prefers Valvular Cæcostomy to appendicostomy for irrigation purposes, the washing out being continued daily for months. If this also fails, a more serious operation must be undertaken for diverting the whole current of fecal matter from the large bowel. For this purpose he advocates Enterostomy, with complete closure of the lower end of the intestine, as preferable to open cæcostomy as advised by Love (*see below*). He discusses the rarity of stricture of the colon after dysentery, and quotes an opinion he obtained from Rogers on this point.

R. J. McN. Love⁷ has also recorded his surgical experiences in Mesopotamia in dysentery. In acute cases in which cæcostomies were performed as a last resort, chiefly bacillary in nature, the results were so discouraging that operative interference was soon given up. In chronic cases, with steady loss of weight under medical treatment, a better field is offered. Appendicostomy only allows of irrigation, without drainage; while, as the whole large bowel can be washed out from the rectum, the operation is of little value. Cæcostomy with Paul's tube gives better, but incomplete, drainage; in one case, after the failure of that operation, he successfully employed complete Ileostomy with closure of the lower end of the ileum, and three months later, after the dysentery had completely cleared up, he restored the bowel by a lateral anastomosis between the ileum and ascending colon. He also discusses the surgical complications of dysentery, including parotitis, often requiring opening of an abscess; arthritis; and perinephric abscess, the latter also requiring drainage. For hemorrhoids and prolapse of the rectum in dysentery, Whitehead's operation may be necessary.

Leveuf and Heuyer,⁸ with Albanian experience, saved 6 out of 10 extremely severe cases of dysentery by cæcostomy, operating between the eighteenth and twenty-fifth days.

Amœbic Hepatitis and Liver Abscess.—P. Talbot⁹ records 15 cases of liver abscess in Mesopotamia, with a history of dysentery in 6. He found a tender spot on palpation over the liver in 14, and regards this as an important diagnostic sign. It is most common over an intercostal space in the axillary line

in abscesses in the posterior portion of the right lobe; below the right ribs when the abscess is near the front of the right lobe; and in the epigastrium in left-lobe lesions. Enlargement of the liver, pyrexia, leucocytosis, signs at the base of the right lung, wasting, and sweats are the other most frequent clinical signs. Four of the early cases were treated by the **Open Operation**, with one death suddenly the day after. The remaining eleven were successfully dealt with by the very simple procedure of **Aspiration** by means of a 20-c.c. glass syringe with fairly large-bore needle, the syringe being detached from the needle and emptied as often as needed; though it is not necessary completely to empty the abscess cavity, as 1-gr. **Emetine** injections daily for a week, followed by every other day, up to 12 or 14 gr., exert as definitely a specific action against the causative amoeba as quinine does in malaria. In addition he saw seven or eight cases of hepatitis following dysentery clear up under emetine without suppuration.

A. B. Chandler¹⁰ also reports on liver abscess in Mesopotamia, which he treated by the open operation, using Cathcart's method of putting in the drainage tube on the stretch, so that on expanding it fits closely—two medium-sized tubes, to allow of irrigation later, being thus better than one large one. Careful sterility in dressing, and emetine injections, are required in the after-treatment, and the tube should be removed in two to three weeks as soon as the thick discharge ceases. He thinks the prognosis depends on the amount of liver substance destroyed. [Possibly he was not aware of Rogers' cases of complete recovery after six pints of pus had been aspirated from the liver without drainage.—L. R.] He agrees that the prognosis of liver abscess has been greatly improved by the use of emetine, and he lost only 1 of 13 cases.

Z. Cope⁶ also deals with this subject, and found amoebic hepatitis readily amenable to emetine, so that liver abscess is easily preventable. He considers that it does not matter much whether the pus is removed by aspiration or by open drainage, as long as the emetine treatment is also used; but if the open operation is used, he rightly insists that the cases should be dressed by the surgeon himself with as strict precautions as for an abdominal section. Of his 16 cases, 10 were drained, and he lost 1 multiple liver abscess case and 1 which became secondarily infected during dressing in a dirty hut. He agrees with Rogers that small multiple abscesses may clear up under emetine.

Gaglio¹¹ states that a few years ago the mortality of liver abscess was 40 to 50 per cent, but since emetine was introduced the number of operations has diminished and the mortality has declined so that the recovery-rate has risen from 54 to 77 per cent. Goulven¹² has also published a thesis in support of the view that emetine not only arrests suppurative hepatitis, but brings about an entire absorption of the pus and complete recovery in a large proportion of cases. In very large collections of pus it is advisable to supplement emetine treatment with aspiration, incision and drainage being very rarely necessary.

R. J. McN. Love⁷ records his experience of liver abscess in Mesopotamia, where he met with a large proportion of multiple abscesses, differing from the descriptions in most text-books, and he had the high mortality of 63·3 per cent in 30 cases, the open operation being used in nearly all of them, and the abscess drained with a rubber tube wrapped in gauze, and irrigated with a weak quinine solution. He has, however, seen cases under others in which **Aspiration** and injection of **Quinine** into the cavity has proved sufficient, especially when the pus was thin, and he agrees that small abscesses may be absorbed under emetine treatment.

REFERENCES.—¹*Brit. Med. Jour.* 1920, ii, 142; ²*Lancet*, 1919, ii, 823; ³*Ibid.* 1920, i, 543; ⁴*Jour. Amer. Med. Assoc.* 1920, ii, 5; ⁵*Arch. of Internal Med.* 1919, 384; ⁶*Lancet*, 1920, i, 579; ⁷*Practitioner*, 1920, 11; ⁸*Paris méd.* 1920, x, No. 15; ⁹*Brit. Med. Jour.* 1919, ii, 375; ¹⁰*Lancet*, 1920, i, 429; ¹¹*Med. Science*, 1920, 578; ¹²*Ibid.* 1919, 71.

ANÆMIA. (See also LEUCOCYTOSIS.)

O. C. Gruner, M.D.

The following is a résumé of Pappenheim's conceptions as stated in the summary of his life's work on this subject (published posthumously).¹ Anæmia is classifiable (1) on a pathological basis, (2) according to the nature of the causative agent or 'noxa'. By the first method we find there are two main types of anæmia; the first concerns only the blood, the second the formative tissues; the latter is always the outcome of the action of some poison, whether it be destructive or productive in action; the former variety may result from simple causes. There are only three types of stimulus²: mechanical (hæmorrhage); purely toxic; excitant of plastic processes. Every case of anæmia belongs to one of these varieties. Clinicians may adhere to the old classification of primary and secondary; but for Pappenheim and his school there is no such thing as primary anæmia, and only through this principle can the blood-findings receive a satisfactory explanation. The object of studying blood-films in an anæmia is to form an idea of the presence or not of degeneration in the blood or in the marrow, and the existence of regenerative processes. If regeneration is taking place, is it functional or is it part of a cytoplasmic process? Defective regeneration simply means asthenia or even paralysis of the marrow.

The clinician calls pernicious anæmia a clinicohæmatological syndrome; the hæmatologist calls it a histohæmatological syndrome. The latter view is the only one which places this disease into proper perspective. The noxa, which has affinities sometimes for circulating cells, sometimes for formative-tissue cells, is not always the same substance. This accounts for variations in the clinical picture.

The evidences of *degeneration* are: poikilocytosis, anisocytosis, loss of hæmoglobin, scantiness of platelets, lymphocytosis, deviation of neutrophils to right.

The evidences of *regeneration* are: polychromatophilia, basophilia, the presence of various forms of nucleated red cells (mitotic cells, pycnotic cells, cells with caryopla: c or with caryorrhæctic nuclei, cells with 'Jolly' bodies.)

Every anæmia falls into this scheme. Splenic anæmia, leukanæmia, aplastic anæmia, cancerous anæmia, puerperal anæmia, etc., are not 'anæmias' so much as cases in which the above-named processes occur in varying degree or in varying combination.

REFERENCES.—¹*Morphologische Haematologie*, Klinkhardt, 1919, ii; ²*Practitioner*, 1919, Nov., 381.

ANÆSTHETICS.

J. Blomfield, M.D.

Anæsthesia for Operations on the Face and Neck.—The large amount of operative work demanded by war injuries of the face and neck has given an impetus to the administration of anæsthetics by methods specially adapted to surgery in this part of the body. Intratracheal ether insufflation, rectal ether, and the use of Kuhn's tube all have their advocates. Rockey¹ describes a method which he believes renders it possible to preserve an aseptic field for operations about the mouth, an end which is not reached by devices in general use for intrapharyngeal anæsthesia. None of these protect the field from mouth secretions or permit the use of efficient antiseptics. These requirements are met by providing a safe² airway for respiration, through which the anæsthetic can be given, and at the same time blocking the larynx from blood or antiseptics strong enough to sterilize the surface, and by protecting the site of operation from re-infection by mouth secretions after it has been sterilized. Rockey's inhaler consists of a curved airway adapted to the mouth and pharynx. The open slotted end rests just above the larynx behind the epiglottis. The inhaler has a movable joint which makes it possible to turn the

tube upward for operations involving the mouth and neck and downward for those upon the face and head. A coffer-dam of gauze packing is carefully placed around the tube. When nasal tubes are used, these are attached to a V-tube so curved that the stem may be firmly fixed over the nose by a strip of adhesive plaster, ensuring stability and preventing kinks. The inner diameter of the pharyngeal tube is $\frac{1}{2}$ in., and that of the connecting rubber tube $\frac{3}{4}$ in. The latter is about 30 in. long, and connects with a funnel of spun metal provided with crossed curved wires supporting a gauze cover. The inhalation tube is so arranged that it is impossible to pour liquid ether into it. Complete anæsthesia must be first obtained, and then the pharyngeal tube introduced and the gauze packing carefully carried out. Anæsthesia must be maintained deeply enough to prevent vomiting, which might clog or displace the tube and destroy the asepsis of the operation field. Delbet's apparatus for pharyngeal intubation,² which is extolled by Dufourmentel, is very similar.

Valuable opinions as to the proper anæsthetic and method of administration in *operations on the thyroid* were given at the Royal Society of Medicine,³ when Mrs. Dickinson Berry described her practice in 700 cases of operation for the removal of goitre. Her method is to employ as light a form of ether anæsthesia as is compatible with the operator's requirements. The narcosis is kept especially light at the time of the dislocation of the tumour, which she regards as a dangerous process in the presence of severe dyspnoea. Straining just after the ligatures have all been tied is regarded as a desirable occurrence, because it lessens the probability of after-hæmorrhage. Two groups of patients run special danger—namely, those with marked tracheal obstruction and those with cardiac trouble. The latter may be secondary to long-standing dyspnoea, or true Graves' disease. A light ether narcosis is the method best suited to both classes. These views were supported by James Berry, who said that he was less and less in favour of local analgesia for goitre operations. He was impressed with the importance of estimating beforehand the exact position and shape of the trachea where it was affected by the goitre, and the exact condition of the heart as shown by complete x-ray and electrocardiographic examination. On the latter point Dr. Strickland Goodall spoke in detail. The examination must determine: (1) The degree of myocardial exhaustion present; (2) The amount of dilatation; (3) The presence or absence of definite myocardial degeneration; (4) The height of the systolic blood-pressure.

At a discussion on anæsthesia in *throat and nose operations* at the same society,⁴ Rood described his technique for very deep ether anæsthesia in adenoid and tonsil cases. A stage is reached at which the pupils are widely dilated, the colour pink, and the vocal cords abducted. The neck is over-extended by the shoulders being raised on a sand-bag. The head rests on the vertex in such a way that the front of the chest, the front of the neck, and the chin are in a line. This places the larynx well above the field of operation, and converts the nasopharynx into a dependent receptacle. All hæmorrhage is stopped before the patient leaves the table. A similar anæsthesia is recommended for direct examination of larynx, trachea, and œsophagus by means of tubes. For operations upon the larynx for removal of carcinoma, chloroform was advised for the preliminary tracheotomy. The air-passages being more or less obstructed by tumour, ether is objected to as being liable to increase the swelling of the mucous membrane and complete the obstruction of the already restricted airway. [The reader is referred to the account of the meeting for the views of several of the leading throat surgeons on the subject of anæsthetics in operations on the upper air-passages.]

Anæsthesia in Cerebral and Spinal Surgery.—Palermo⁵ recommends the use of ether-oxygen. He describes the simple apparatus by which it is given,

little besides the oxygen cylinder and tubes to and from the ether bottle. The administration is begun simply with ether by an open method, and when induction is passed, the ether-oxygen tank is connected, and the anæsthetist is able to remove himself entirely from proximity with the operation area. The patient is kept very lightly narcotized, "children usually crying, but relaxed". The narcosis is increased when the dura is reached. Afterwards it is allowed to diminish, and the patient is nearly round when the operation is completed. The author has employed this method on 250 patients, 16 being for Gasserian-ganglion operations, and regards it as uniformly successful.

Rectal Ether Anæsthesia.—This method meets with severe criticism from Vitrac and from Wiart,⁶ who provide details of fatalities and of intestinal hæmorrhages. It is not possible, however, to see from the accounts given whether technical errors of dosage and method of injection may not be to blame for the results deplored. It is obvious that in such a method, where the whole dose is given at once, it is highly necessary to play for safety; and it is far better to risk achieving only a partial anæsthesia, which can always be easily supplemented by inhalation, than to give an excessive quantity of the oil-ether mixture. In the practice of several anæsthetists there have now been large numbers of rectal anæsthesias with only slight complications, such as a short diarrhœa with blood, and with no fatalities referable to the method.

Manine and Le Page⁷ describe the use of pure ether instead of the usual ether-oil mixture. They have never observed irritation of the rectal mucosa or any other inconvenience, but they have as yet had no extended experience.

Lathrop⁸ has employed rectal ether for 1002 patients, mostly in those undergoing operation for goitre; 166 were subjects of hyperthyroidism or exophthalmic goitre. Post-operative effects he finds better than after inhalation anæsthesia. This author claims that there are peculiar elements of safety in the rectal or colonic oil-ether method. The rate of evaporation of ether from oil takes place in accordance with well-known physical laws. Unless the temperature is raised to a high point the ether passes off slowly, especially at the body temperature. After administering the mixture it is impossible to withdraw oil and leave ether, or vice versa. Each molecule of one is bound to a molecule of the other, and the union is broken only by evaporation. Thus it is also impossible to have deep narcosis at one moment and light at another. When the colon is fully distended, less ether is absorbed. Again, when the ether leaves the oil as a gas, the intestine is cooled. Elimination and absorption are thus retarded and the dose regulated. The study of sphygmographic tracings of a number of animals for one hour during colonic anæsthesia showed that pulse and respiration remained constant. Another factor of safety lies in the circumstance that the ether-oil mixture kills the colon bacillus rapidly.

The Use of Ether in India, which is often stated to be impracticable, is described and favourably commented upon by L. M. Routh.⁹ The chief obstacle is difficulty of transport.

Effect of Ether on Tubercle.—It is commonly held that in the presence of pulmonary tubercle ether should not be administered. Zueblin¹⁰ maintains that the onset of active tuberculosis frequently follows an operation performed under ether anæsthesia. Investigations of the action of ether on the *B. tuberculosis* have shown that it partially extracts the fatty constituents of the bacterium. Partial antigens may be very powerful. It is suggested that a process of this kind may take place in a tuberculous focus during ether anæsthesia, and that evil effects may be due to the liberation of toxic substances. It is permissible, however, to doubt whether an ether vapour comparable in concentration with that used in experiments is ever brought into contact in the living body with tuberculous deposits or bacteria present there.

Prolonged Administration of Nitrous Oxide.—The present writer describes¹¹ a method of using ordinary *gas and ether* apparatus for prolonged administration of nitrous oxide. The method is recommended for the type of case which was so frequent in after-war surgery—exploration of sinuses, delivery of sequestra, and the like—and not for abdominal operations except in the easiest kind of patient.

The Protective Action of Sodium Bicarbonate given Intravenously during Chloroform Anæsthesia is explained by Evarts Graham.¹² This experimenter maintains that the toxic effects of chloroform are mainly due to free hydrochloric acid dissociated from it in the body. He gives details of experiments on animals supporting his view; but it must be remembered that many other experimenters have shown to their own satisfaction that chloroform is not split up in the body. Davis and Whipple have attempted to repeat Graham's experiments, and they deny the correctness of his conclusions. These observers state that "carefully controlled experiments show beyond reasonable doubt that carbonates given intravenously or by mouth have no effect whatever on the injurious action of chloroform on the liver". The question is of practical importance, and cannot yet be regarded as definitely settled. In practice some surgeons believe that administration of alkalis for some days before chloroform inhalation lessens the chance of post-operative trouble; and it is customary, when symptoms of acidosis arise after anæsthesia, to wash out the stomach with alkaline solution and leave some of this in.

Post-operative Treatment.—The beneficial effects of *large enemata* after operation are insisted upon in an article¹³ dealing with post-operative welfare. The writer gives 2 quarts of water with 6 drachms of bicarbonate of soda per rectum quickly, before the patient leaves the table after an abdominal operation. About half an hour later this is followed by another 2 or 3 pints of water per rectum, given in about fifteen minutes. Repeated injections of scopolamine are employed during the first twenty-four to thirty-six hours.

Therapeutic Use of Carbon Dioxide after Anæsthesia and Operation.—This proceeding has been investigated and recommended by Yandell Henderson and co-workers.¹⁴ Carbon dioxide is nature's own stimulant to the respiratory centre, and these workers state that its influence on the circulation is equally important, particularly on the venous return to the right heart. "It is the insufficiency of this return that chiefly gives to post-operative depression its similarity to the effects of hæmorrhage." Rapid return of normal arterial pressure is the result to be expected from restoration to the blood and tissues of the carbon dioxide lost during anæsthesia and operation. It is stated that the reason for the neglect of CO₂ inhalation is that without suitable apparatus, and due skill and care, such inhalation easily becomes highly dangerous. In the apparatus figured (Fig. 3), the mask is so constructed as to prevent the

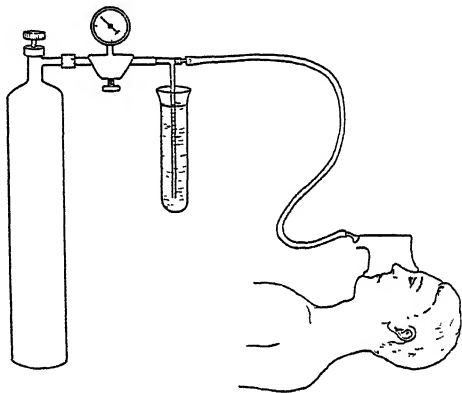


Fig. 3.—Apparatus for administering carbon dioxide.

possibility of accumulation of gas within it, with consequent excess administration. The gas is delivered through a number of small openings just outside the open end of a short large tube connected with the mask. During expiration or apnoea the CO_2 merely wastes into the air; during inspiration it mixes with the inspired air. Control observations, without administration of CO_2 , showed that after a patient was back in bed arterial pressure continued to fall for an hour, to a level 30 mm. below normal. Respiration during this time was constantly depressed, and the elimination of ether correspondingly slow. Seventeen patients were treated with post-operative inhalation of carbon dioxide, generally 8 per cent of the gas in air. The benefits noticed were raising of the blood-pressure, rapid elimination of the anæsthetic, diminished vomiting, and abolition of abdominal distention. From so few examples positive conclusions cannot be drawn, but the uniformity of behaviour of these patients gives a hopeful outlook for the method of treatment.

Ethyl Chloride.—An apparatus for the *prolonged administration of ethyl chloride* is described by Abbrand.¹⁵ Anæsthesia is obtained with a maximum dose of 3 to 5 c.c. in adults, and is maintained by the use of 1 c.c. per minute, evaporated within an enclosed space. After ten minutes or a quarter of an hour it is often possible to withdraw the mask altogether for a couple of minutes, replacing it on the first symptom of recovery. The apparatus affords the anæsthetist complete control of the supply of ethyl chloride, and is adaptable to the sitting or lying position of the patient. It consists essentially of the 'doséthyleur' (of Robert and Carrière) adapted to a Camus mask.

Anæsthesia in Thoracic Surgery.—In order to determine the best agent and most suitable mode of administering it for patients requiring chest surgery after war injuries, Gwathmey and Connell¹⁶ conducted a number of experiments the results of which may well be of value in thoracic operations of civil practice. One result of their experiments was to show that, contrary to the findings of Crile, animals stand shock under ether properly given as well as they do under nitrous oxide. Some hours after the experiment, however, the animal that has had ether suffers from a lowering of blood-pressure, which does not occur in the animal that has been under nitrous oxide and oxygen. Nitrous-oxide-oxygen was selected as the best anæsthetic for lung surgery. Endotracheal and endopharyngeal methods of administration, which have been used successfully for lung surgery, were avoided because of the initial deep narcosis required. The war patients often came to operation in a state of shock in which any deep anæsthesia was undesirable. A positive-pressure face-mask method was finally selected. A pressure of from 5 to 12 mm. Hg was arrived at as a result of the animal experiments. It was found that the required pressure could be estimated easily, for when the rubber bag is distended to such an extent that on full inspiration the seams of the bag are still slightly distended, then there is a pressure of from 5 to 7 mm. Hg. The method involves: (1) A constant supply of fresh gases; (2) A constant escape of some of the gas; (3) A slight amount of rebreathing. The oxygen percentage used with positive pressure was never less than 1 to 3. A very light narcosis was aimed at, and morphia freely used beforehand. Deep narcosis after morphia has proved to be dangerous. On the other hand, the more morphia given beforehand, the larger was the proportion of oxygen that could be used and the greater was the quiet and comfort after operation. In all chest surgery the patient was given from $\frac{1}{4}$ to $\frac{3}{8}$ gr. of morphia hypodermically from forty minutes to one hour before operation. The state produced after this by the positive-pressure inhalation of nitrous oxide and oxygen in the proportion of 3 to 1 is described as "analgesia with first-stage anæsthesia". The patient

is pink, with active lid reflex, but relaxed muscles. He is safer than if full surgical anæsthesia were maintained with the gases alone, or than if analgesia were maintained with morphia alone. The next best preliminary sedative to morphia is stated by the authors to be ether 4 drachms, liquid paraffin 6 drachms, mixed and given by the mouth, with salt, pepper, and lime-juice on the bottom of the wineglass and also on the top of the mixture. The method outlined above is said, during three months' experience, to have prevented collapse and to have abolished pneumonia, as well as to have reduced the incidence, degree, and extent of pleurisy.

Resuscitation in the Syncope of Anæsthesia.—In an article on *massage of the fibrillating ventricles*, A. G. Levy¹⁷ discusses the physiological principles involved in the method, as well as their clinical application. He concludes that there is a natural tendency to recovery in the fibrillating human heart, just as there is in the cat's heart. The dog's heart shows no such tendency. From the experiments that he details, and from the experience of others, the author draws the following among other inferences:—

1. The explanation of the action of massage of the heart is production of an artificial circulation of oxygenated blood through the coronary arteries. In this way the ventricles are made to resume active fibrillation (or the 'first stage' of fibrillation), in which condition they possess a natural tendency to revert to a rhythmic beat. The ventricles cannot resume their beat in the 'second stage' of fibrillation, which is the result of asphyxia of the fibrillating ventricles.

2. Successful performance of massage depends upon efficient compression of both ventricles and an efficient system of artificial respiration.

3. In the interest of the nerve centres massage should be begun not later than five minutes from the moment of cardiac failure.

4. There is good reason to believe that cardiac massage, if carried out in an efficient and persistent manner, should prove an effective means of restoration from apparent death due to chloroform syncope, whether this be the result of ventricular fibrillation or of neglected overdose.

Norbury¹⁸ has provided a comprehensive clinical view of cardiac massage, and an illustrative case may also be found.¹⁹

Herschen²⁰ relates an instance of recovery from syncope brought about by injection into the heart of 1.5 c.c. of 1-1000 *epinephrin* solution. The injection was made through the fourth left interspace inside the mammary line at a depth of about 2 cm. When the heart beat again, 700 c.c. of physiological saline, with 10 drops of *epinephrin* solution, were infused into the arm.

Intratracheal Insufflation of Chloroform.—This method has not been frequently employed. C. H. Mott²¹ described his apparatus and technique, and several surgeons testified to the excellence of the anæsthesia. Yet there appears to be no advantage over ether similarly given, in cases where insufflation is desired, and other observers have testified to the dangerous symptoms easily evoked with chloroform used in this manner.

Anæsthetic Tremor.—A novel method of overcoming tremor, which is sometimes an inconvenient phenomenon of narcosis, is described by Rietz.²² The tremor attacks chiefly the lower extremities. It is common only with ether, and generally appears towards the end or at the beginning of narcosis. It is more usual with males than females. The author compares the tremor with other rhythmic contractions which are considered to depend on abnormal irritation of the motor centre or tracts. He therefore attributes tremor during anæsthesia to irritation produced by the narcotic on the brain in specially susceptible subjects. In order to overcome the phenomenon, he presses on

the neck in the carotid fossa. In some cases the tremor at once disappeared. With 33 patients, the measure was ineffective in 5, uncertain in 5, and certain in 19. The pressure is applied with the thumb or four fingers, the patient's head being directed away from the side compressed. Reitz argues that, since active pressure applied to large nerve trunks produces no similar effect, therefore the influence of this pressure is not owing to any reflex, but is due to its compression of the carotid and diminution of blood-supply to the brain.

Spinal Anæsthesia.—In a discussion of the *physics and technique of spinal injection*,²³ Delmas shows the different effects produced by injecting forcibly or gently, and by the high or low pressure of the cerebrospinal fluid. Briefly, the conclusions are that the higher the pressure of the fluid, the more localized and slow is the action of the injected drug, and these results follow also on injecting very gently, even if the cerebrospinal fluid is at a low tension. His method involves the use of a large needle, the escape of 20 c.c. of cerebrospinal fluid, and forcible injection of the solution. The result is '*diffusion homogène*'.

The details of a death²⁴ from *apothesis* spinal anæsthesia seem to leave no doubt that the injection was immediately responsible for the fatality. The patient was, however, in an advanced stage of tuberculosis. Collapse occurred about two minutes after injection, and before any operation had begun. Another death following the spinal injection of apothesis²⁵ was attributed to cerebral hæmorrhages, and it is suggested that these may have been owing to a toxic action of apothesis on the cerebral vessels, since there was no arteriosclerosis or raised blood-pressure.

Local Anæsthesia.—Hamilton, after a discussion of experimental work, concludes that *apothesis* is an effective non-toxic local anæsthetic, especially valuable for terminal anæsthesia and nerve-blocking. Its efficiency and safety are increased by the addition of adrenalin and of digitalis.

For the use of Saligenin as an anæsthetic, see p. 20.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1919, Dec., 421; ²*Presse méd.* 1919, Sept 22, 537; ³*Proc. Roy. Soc. Med.* (Anæsthetic Sect.), xiii, No. 8, 45 et seq.; ⁴*Ibid.* No. 8, 1-28; ⁵*Med. Record*, 1920, Feb. 7, 231; ⁶*Surg. Gynecol. and Obst.* 1919, Oct., 247; ⁷*Ibid.* 1920, March, 164; ⁸*Jour. Amer. Med. Assoc.* 1920, July, 82; ⁹*Brit. Med. Jour.* 1919, ii, 464; ¹⁰*Surg. Gynecol. and Obst.* 1920, Aug., 103; ¹¹*Lancet*, 1920, Jan. 31; ¹²*Arch. of Internal Med.* 1920, June, 575; ¹³*Amer. Jour. Obst.* 1919, Dec., 677; ¹⁴*Jour. Amer. Med. Assoc.* 1920, March 20, 783; ¹⁵*Presse méd.* 1920, May 5, 276; ¹⁶*Med. Record*, 1920, June 12, 987; ¹⁷*Heart*, 1920, April; ¹⁸*Lancet*, 1919, ii, 601; ¹⁹*Ibid.* 784; ²⁰*Schweiz. med. W'ch.* 1920, April 1; ²¹*Lancet*, 1919, ii, 1197; ²²*Surg. Gynecol. and Obst.* 1920, April, 361; ²³*Presse méd.* 1920, Aug. 28, 596; ²⁴*Jour. Amer. Med. Assoc.* 1920, Aug. 28, 605; ²⁵*Ibid.* Jan. 3, 19.

ANEURYSM, AORTIC.

Carey Coombs, M.D., F.R.C.P.

TREATMENT.—MacLachlan¹ thinks the best plan is to enjoin prolonged rest: absolute rest in bed for six weeks or so, followed by a gradual return to work, usually to an occupation less strenuous than that followed before the treatment. Diet he thinks is of minor importance. In addition to giving Potassium Iodide, he attacks the cause by means of Mercury and Diarsenol. His impression is that these drugs help to arrest the growth of the aneurysm.

Hare² has treated three more men with aneurysms by means of introducing Gold and Platinum Wire into the sac and passing an electric current through it. He thinks the operation justified by the relief from pain which it affords. Two of the men survived for a month after the electrolysis; the third was alive and feeling fit for work ten weeks after operation.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1920, i, 525; ²*Jour. Amer. Med. Assoc.* 1919, ii, 1865.

ANKYLOSTOMIASIS.*Sir Leonard Rogers, M.D., F.R.S.*

L. Schapiro¹ has estimated the economic and physical benefits of treatment for hookworm disease among the plantation population of Costa Rica, and found a permanent increase of the hæmoglobin, which continued after the treatment was concluded, and this was accompanied by an increase of working power of 14.6 to 27 per cent, while on one farm there was also a reduction of 15 per cent in the unit pay and an increase in the acreage cultivated of 33 per cent. There was also a reduction in the sickness and infantile death-rate, so there can be no doubt as to the lasting benefit of the treatment.

J. H. White and I. L. Neilson² record an investigation of the mental development of Queensland school-children with and without hookworm infection, by means of the Binet-Simon scale of intelligence and the Porteus mazes. They obtained definite evidence of impaired mentality in even lightly infected children, and a loss of as much as 16 to 24 months in heavily infected ones. There was also retardation of physical growth, so the harmfulness of the parasite was abundantly evident.

H. K. Soltau³ records a case in which a pyloric obstruction requiring gastro-enterostomy occurred in a patient who had passed large masses of ova of *Ankylostoma duodenale*, which it is suggested might have been the cause of the ulceration in the stomach.

TREATMENT.—J. L. Kantor⁴ advocates direct introduction of Oil of Chenopodium into the duodenum through Einhorn's or Rehfuß's tube or that of Jutte. No preliminary purge is given, and a light meal of rice and milk is allowed in the evening. The next morning the duodenal tube is swallowed, and as soon as it is known to have reached the duodenum through bile-containing fluid being removed by aspiration, 2 to 3 c.c. of oil of chenopodium is injected, followed six minutes later by 2 to 3 oz. of warm saturated solution of Magnesium Sulphate, and the tube withdrawn. Usually three to four stools follow, often beginning within half an hour, but if necessary a purge may also be given. Toxic symptoms were slight, only one case of temporary collapse occurring after the exceptionally large dose of 5 c.c. He considers that the results of 250 such treatments seem to be superior to those of other methods. In a further paper Kantor⁵ discusses the number of treatments required to cure hookworm disease completely, based on 231 army cases kept under observation from 29 to 228 days after treatment, and concludes that five treatments by the oral method are necessary to obtain good results with oil of chenopodium, while by his duodenal tube method he obtained 100 per cent of cures by three treatments, and 80 per cent by one treatment. (*See also p. 7.*)

S. T. Darling^{6, 7} reports further researches on the oil of chenopodium treatment in the Far East. A close positive relationship was found between the degree of anæmia and the number of worms found—as long as malaria is not very prevalent, as that disease increases the anæmia greatly. An estimate was made of the amount of anæmia caused by a given number of worms, and the conclusion was arrived at that the loss of 1 per cent of hæmoglobin is caused by about 10 worms in women, 7.6 in boys nine years of age, and 11.7 in men. The gain in hæmoglobin after treatment for hookworms is much greater in non-malarious than in malaria-infected subjects, having averaged 9.2 per cent. Further experience confirms the former conclusion that oil of chenopodium gives better results than thymol, while it is one-fifth of the cost for efficient doses. The treatment can be simplified by omitting the preliminary purge, a light meal being given the evening before and only milk on the morning of the treatment, and the drug followed an hour later by 2 oz. of a concentrated solution of magnesium sulphate containing practically 1 oz

of the salt. The optimum dose of the oil is 3 c.c. divided into three doses of 1 c.c. each with two hours interval between each, but equally good results were obtained by 0.5-c.c. capsules three times at hourly intervals and a second treatment with the same dose after not less than a week. Severe toxic symptoms were thus avoided, and 99 per cent of the worms were removed. The most heavily infected communities should first be treated; and where a very large proportion of the inhabitants are infected, all may be treated with advantage without microscopical examinations of all their stools, which greatly simplifies matters and reduces the cost very much. He regards 50 worms as a light infection, 50 to 100 as moderate, and over 100 as severe.

O. T. Brosius and W. A. Bishop⁸ deal with intestinal parasites in Colombia, where 98 per cent of the native population are infected, 75 per cent with hook-worm disease; the average hæmoglobin in 100 unselected persons was only 45.49 per cent, and these showed an average increase of almost 20 per cent after treatment with oil of chenopodium, while in children the increase was much greater. A differential leucocyte count showed an eosinophil increase to over 4 per cent in 90 per cent of the cases. The purest oil of chenopodium should be used in the treatment, and the authors have reduced the dose to from 35 to 40 min. in adults and 1 min. for each year of age in children, two treatments being given to each patient, which ensures 95 per cent of the worms being expelled.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, ii, 1507; ²*Ibid.* 1877; ³*Lancet*, 1919, ii, 690; ⁴*Jour. Amer. Med. Assoc.* 1919, ii, 1181; ⁵*Amer. Jour. Med. Sci.* 1920, 497; ⁶*Ind. Med. Gaz.* 1919, 446; ⁷*Lancet*, 1920, i, 69; ⁸*Jour. Amer. Med. Assoc.* 1920, i, 1768.

ANOXÆMIA. Employment of Oxygen in (p. 16).

ANTHRAX. (*See INFECTIOUS DISEASES PREVENTION; see also ARSPHENAMIN, p. 4.*)

ANUS, TUBERCULOSIS OF.

J. P. Lockhart-Mummery, F.R.C.S.

Tuberculosis of the anus may occur either as a primary infection or as secondary to tuberculosis of the lungs. By far the commonest form is the secondary variety. Most tuberculous fistulæ occur late in cases of tuberculosis, and are due to swallowed sputum and the tubercle bacilli surviving their passage through the alimentary canal. Tuberculous fistulæ are generally characterized by the absence of pain, the absence of fibrous deposits round the fistula, the thin character of the pus, and the undermining of the skin edges. An interesting paper on this subject is contributed by Charles J. Drueck.¹ He divides tuberculosis of the anus into the ulcerated lupoid and the verrucous types. He points out that lupus of the anus was for a long time considered to be a syphilitic manifestation, but is now known to be due to tubercle. The disease begins at the mucocutaneous junction as a reddish-brown nodule, which later breaks down to a small clear-cut ulcer with an indurated base and irregular outline. There is dense fibrous infiltration beneath the ulcer, which has to be diagnosed from cancer and syphilis. The appearances are quite characteristic to anyone who has had experience of the condition. Discussing the treatment of tubercle of the anus, he points out the necessity for thoroughly eradicating the disease, preferably by means of a **Cautery**. Following operation, the wound should be exposed to sunlight for several hours a day, a thin white cloth being used if the sun is very strong, to prevent the skin burning. **Finsen Light** also gives good results. He fails, however, to mention **X Rays**, which are also very effective, and in this country, where sunlight is comparatively rare, will probably be found preferable.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1919, Oct., 393.

AORTIC ANEURYSM. (*See ANEURYSM, AORTIC.*)**APPENDIX, SURGERY OF.** *E. Wyllys Andrews, A.M., M.D., F.A.C.S.*

Cope¹ mentions a new sign present in certain inflammatory conditions in the pelvis, as a pelvic appendix, salpingitis, etc. It is based on the fact that the obturator internus muscle lies on the lateral wall of the pelvis, and its fascial envelope is liable to be involved in any pathology in the vicinity (*Fig. 4*). Rotation of the leg under these circumstances causes a pain referred to the hypogastrium.

Williams and Slater² have gone so far as even to doubt the existence of chronic appendicitis. They examined the appendix in 500 laparotomies of patients having no symptoms of appendicitis. I quote their own summary:—

1. About one-third of all women operated on for various pelvic conditions show undiagnosed lesions of the appendix.

2. In some cases these lesions are the result of extension of an inflammatory process to the appendix from the pelvic organs; but at least one woman in every five shows an appendix lesion without symptoms and without discoverable cause (so far as the pelvic organs are concerned).

3. These lesions are nearly all chronic in nature, and consist of the following types: (a) Adhesions without change in the muscular or mucous coats; (b) Chronic inflammatory changes in all the layers; (c) Pericæcal veils.

4. The frequency of these lesions is of importance in its relation to two questions: (a) Are such undiagnosed lesions of the appendix the undiscovered cause of reflex symptoms elsewhere? (b) Is there such a clinical entity as chronic appendicitis, or are the symptoms usually ascribed to chronic appendix disease in reality due to some other condition, and such changes as are so frequently found in the appendix of no clinical significance? We are inclined to this latter view, but do not feel justified in drawing a definite conclusion to that effect on the evidence to date. We believe that this subject offers a fruitful field for further investigation, and hope that interest may be aroused to prosecute the study of it to a final settlement of the above questions.

[The reviewer believes that we must recognize the large number of patients with constipation, neurasthenia, and ptosis who complain of pain in the right lower quadrant and often have diagnosed their own cases as appendicitis, and realize that most of these are not benefited by appendectomy. We should confine our operations to those presenting the type of symptoms described by Stanton (*see below*). The reviewer believes that a definite history of an acute attack is nearly always present in the real cases.—E. W. A.]



Fig. 4.—Diagram to show relationship of pelvic appendix to the obturator internus muscle. An appendicular abscess is seen in contact with the fascia over the obturator internus. A, Iliacus; B, Obturator internus; C, Alcock's canal; D, Appendix; E, Rectum; F, Levator ani.

Stanton³ discusses the symptoms of 110 cases of chronic appendicitis operated on by him and cured. He contrasts the picture with a number of other cases diagnosed as chronic appendicitis but not cured by appendectomy. Visceroptosis, atonic colon, and many other conditions often cause pain in the right iliac fossa, and the differential diagnosis is important. In true chronic appendicitis nausea is a very prominent symptom; its absence points toward the more common colitis. Constipation, gas, and loss of appetite are present more often in pseudo-appendicitis, and are not part of the picture of the true cases. In pseudo-appendicitis, too, the pain is not confined to the right lower quadrant, and appendectomy does not cure it.

Témoin,⁴ in the Paris Academy of Medicine, has recently presented a long review of the appendicitis problem. He presents both sides of the controversy between the so-called 'interventionists' and the 'opportunists'. Among the more radical, Témoin and Hartmann have been prominent, while others, Bazy and Jalaguier, and Walther, are more moderate in their position. All practitioners to-day are familiar with the semeiology of appendicitis and recognize it early, but doubts were still evident at this meeting as to the advisability of hard-and-fast rules in operating. Since the time when Dieulafoy promulgated the dogma "There is no medical treatment for appendicitis", divergent opinions have prevailed. To-day less positive dogmas are insisted upon. Not only the 'abstentionists', but all surgeons, recognize certain indications for waiting. Even Hartmann, who has been very radical, occasionally temporizes. In favour of immediate operation early, the arguments still have force—the cutting short of a grave crisis, and the prevention of possible, fulminating peritonitis—but, as Jalaguier states, we must admit that an appendicitis properly watched and guided may go on without danger to a more favourable period for operation, if seen too late for a real primary operation. This is no more than a repetition of the long controversy carried on in America some years ago on the same problem. There is really less room for controversy when we consider that both parties believe in operation, the only difference being as to the proper time. All surgeons advise early operation when this is possible, the only real controversy being as to whether certain late cases, seen after the third day, when protective adhesions are already guarding the diseased area, should be treated expectantly for a few days or submitted to immediate laparotomy. Even these cases must be interfered with later, say after ten days or two weeks; but it is the belief of Ochsner, Mayo, and others in America, as well as the 'opportunists' among the French surgeons, that there is a danger period between the fourth and tenth day when expectant treatment will give a lower mortality than operative treatment.

For X-ray treatment of the appendix, see p. 28.

REFERENCES.—¹*Brit. Jour. Surg.* 1920, April, 537; ²*Ann. of Surg.* 1919, Nov., 535; ³*N. Y. Med. Jour.* 1919, Sept. 6, 406; ⁴*Bull. de l'Acad. de Méd.* 1919, Oct. 28, 16.

ARTERIAL TENSION, HIGH.

Carey Coombs, M.D., F.R.C.P.

ETIOLOGY.—The difficulty of arriving at a satisfactory understanding of the causes of disease is nowhere better seen than in the problem of high blood-pressure. Papers written during the year illustrate this by the conflicting replies which they return to the questions: In cases of high blood-pressure associated with renal disease, which causes the other, or does some common cause account for both? and—In cases of high blood-pressure where no renal lesion can be found, why did the blood-pressure go up? The reader will find a balanced summary of the classical writings on this point in Gallavardin's¹ exhaustive monograph. He does not attempt a final judgement upon these points; but he is sure that in some cases at all events the renal lesion precedes

and causes the rise of blood-pressure, although the mechanism by which it does so is not yet understood. In other cases, may be, the arterial lesions precede the renal, or are perhaps due to causes which at the same time are injuring the kidneys.

The admission of this possibility is forced on us by recognition of the fact that there are persons with high arterial pressure but without renal disease. Even the most careful search fails to prove any insufficiency of the kidneys. Several American physicians have written on such cases under the title of 'vascular hypertension'. Engelbach,² relating such cases with those of 'climacteric hypertension' alluded to in last year's MEDICAL ANNUAL, tries to associate them all with 'endocrine dyscrasia'; but his evidence is very conflicting, since in some of his cases the thyroid (for instance) was excessively active, in others defectively so. O'Hare's³ observations lead him to conclude that the vasomotor system in vascular hypertension is extremely labile and sensitive. He finds the vessels particularly sensitive to the effect of adrenalin injected into the muscles, which causes a sharp rise in pressure. This sensitiveness has been noted and examined by Clough,⁴ but he thinks it can be explained without recourse to the 'endocrine' hypothesis, which supposes that in these people the adrenals are over-active and pouring out an excess of their internal secretion into the circulation. In another paper by O'Hare⁵ he shows that persons with vascular hypertension cannot use up excess of glucose given to them by mouth. He links this up with the fact that such people often become diabetic. One is also reminded of the effect that excessive adrenal activity has in increasing the blood-sugar. But when one comes to speculate on endocrine activities, one finds a maze of possibilities and probabilities that is almost trackless at present. It is perhaps of as much practical value to reflect that even if we could prove certain endocrine disturbances to be at the back of high blood-pressure, we should still have to account for these disturbances. We are therefore compelled to look for influences impressed on the individual from without, which, whether through endocrine or other mechanisms, provoke a rise in blood-pressure. In this connection we may particularly note O'Hare's³ observation that in persons with vascular hypertension mental and physical rest caused a marked drop in pressure, while mental excitement provokes an even sharper rise. Moschcowitz⁶ may also be quoted here. He says that a large proportion of these patients conform to a certain mental and physical type: short neck, soft muscles, an obese figure, associated with an irritable mind, concentrated solely and with excessive intensity on business pursuits, worrying over trifles.

DIAGNOSIS.—The technique of measurement of arterial tension continues to exercise many minds. Gallavardin, in the book alluded to above,¹ discusses the whole matter at length. He says that the best way to determine the systolic pressure is by touch. The diastolic figure he finds by the vibratory method, using the auscultatory method for cases in which the vibratory plan is not definite enough. The vibratory method which he describes differs from the auscultatory only in this, that the point at which the arterial vibrations drop suddenly from the clearly perceptible to the almost imperceptible is in the former method found by a finger over the brachial artery at the bend of the elbow, below the manometric cuff, while in the latter it is found by a stethoscope over the same spot. Mackenzie,⁷ who is assistant medical director of a large insurance office in America, says that his office is in the habit of asking its examiners to state systolic and diastolic pressures in their note of examinations; and he finds that there is a good deal of variability as to the diastolic point. This he ascribes to variation in the examiners' interpretation of what constitutes the point of diastolic pressure. He thinks that examiners

ought to take as diastolic pressure the moment at which the sounds heard at the bend of the elbow when the manometer cuff is being deflated disappear *entirely*; not the point (which most of us take) when those sounds drop suddenly from relative audibility to something scarcely audible. The difference between the two points is usually quite small, but the point of *total* disappearance he considers to be the more constant of the two. Sewall⁸ directs attention to three types of variation to which the blood-pressure is normally subject. The first is postural: to stand up from a lying position means a rise of diastolic pressure with little or no rise of systolic pressure in a normal person. In persons with functional vasomotor instability (of the type discussed under HEART, IRRITABLE) the systolic pressure often falls even though the diastolic pressure rises. The second variation is respiratory: the systolic pressure is maximal during expiration. The third type of variation Sewall calls vasomotor: it may so influence systolic pressure as to bring about a change of 30 mm. Hg within a minute. Such variations are more pronounced in those persons who are usually labelled 'neurotics'. Kahn⁹ has examined the effect on the arterial pressure of raising the arm from which readings are being taken. Normally, as the arm rises, the systolic and diastolic pressures fall. In hyperthyroidism and in persons with the 'irritable heart', this fall is sharper than in normal subjects. In nephritic hypertension, on the other hand, there is little or no fall.

TREATMENT.—Moschcowitz¹⁰ has some sound advice, leaning perhaps rather far in the direction of disbelief in the nephritic factor, yet illustrating well the tendency of to-day (and as we believe a perfectly sound tendency) to ascribe more importance to the mental and less to the physical factor in hypertension. The doctor must, he says, explain tactfully to the patient that high blood-pressure is caused by many influences over which the patient has some control. The advice to retire from business is generally bad; patients with hypertension need something to think about. But they may be advised not to increase their activities. Exercise is needful, golf being particularly commended, also walking. This, with a mild restriction of diet all round (not especially as to proteins), leads to an altogether beneficial drop in the patient's weight. Of drugs he speaks well of *Digitalis* only. This he uses in compensated cases as well as in decompensation. He thinks that if the pulse can be kept to 60 or thereabout the drug is doing good, and he claims that it keeps at bay the various symptoms that foreshadow breakdown.

REFERENCES.—¹*La Tension artérielle en Clinique*, Masson et Cie., Paris, 1920; ²*Jour. Amer. Med. Assoc.* 1920, i, 1619; ³*Amer. Jour. Med. Sci.* 1920, i, 369; ⁴*Johns Hop. Hosp. Bull.* 1920, 266; ⁵*Amer. Jour. Med. Sci.* 1920, ii, 366; ⁶*Ibid.* 1919, ii, 668; ⁷*Med. Record*, 1920, i, 1029; ⁸*Amer. Jour. Med. Sci.* 1919, ii, 786; ⁹*Ibid.* 823; ¹⁰*Ibid.* 1920, i, 517.

ARTHRITIS. Use of Colloidal drugs in (p. 10); Iodine (p. 14); Peptone (p. 19); Milk (p. 20); Vaccines (p. 22).

ASTHMA, BRONCHIAL, AND HAY FEVER. *Arthur Latham, M.D., F.R.C.P.*

Treatment of Bronchial Asthma with Vaccines.—Of a series of 90 patients examined in whom a diagnosis of bronchial asthma was made, 81 have been treated with *Autogenous Vaccines* by Hutcheson and Budd.¹ So far as possible those cases were selected in which obvious and accessible foci of infection had been removed. Most of these patients had suffered over a considerable period and were well versed in the various cures, while in many instances one or more operations on the nose, throat, or sinuses had failed to give relief. Where the first series of injections was ineffective, if possible a second vaccine was prepared and administered, and this was also done in a number of cases

after relapse had occurred. In 53 cases (74.6 per cent) after administration of the vaccine there was either complete freedom from asthma or a definite decrease in the frequency and severity of the attacks. The longest duration of complete relief was three years. The longest period of relative relief was four years and two months. In 18 cases (25.4 per cent) no definite benefit was derived from the vaccine. In none of these cases, however, was the treatment repeated after the first series of injections had failed.

Peptone Treatment of Asthma.—In discussing the effects of **Peptone** treatment, Auld² states that there are two main groups of asthma as far as reactions to peptone are concerned. One group comprises those who quickly respond to the treatment, and the effect is more or less lasting; the other group is mainly resistant to the treatment. The first group presents as a rule the following characteristics: general good health, slight family predisposition, limited duration of the disease, regularity in recurrence of attacks, freedom from bronchitis and emphysema. The second group includes nearly all those with chronic bronchitis and developed emphysema, and cases presenting any degree of cyanosis, even without bronchitis; also those in whom, apart from the asthmatical paroxysms, a more or less oppressed condition of the respiration is practically never absent. As a rule, the affection has lasted many years, dating from childhood, or from the age of puberty, and a family history of asthma can nearly always be elicited; sometimes hay fever also is found. Often the only effect that can be produced in such cases by means of peptone—and it has very important bearings—is the complete suppression of the attacks for a short period by a mildly toxic dose.

In regard to the immunization in difficult cases, there are two if not three necessary considerations: (1) The rate of injection of the peptone and its dilution; (2) The peptone to be used; and (3) The indications afforded by the dermal reactions as the case proceeds. If the patient takes the peptone well, larger doses may succeed, given by very slow injection to avoid reaction. If the patient is sensitive to peptone, however, great care is required, as the larger dose given in this way may precipitate an attack of asthma. Rarely this occurs very quickly—in a few minutes—with concomitant flushing of the face, especially if Witte's peptone be used, which seems to contain a toxic ingredient not present in muscle peptone. Again, a mixture of peptones sometimes succeeds best. The dermal reaction (which may be produced by a von Pirquet borer) is not of much value at the beginning, as non-asthmatical subjects may give it, and it varies considerably in different persons; but as immunization proceeds, it ought to lessen, and finally disappear—that is, show no distinction from the control made with the solution in which the peptone is dissolved. Experience proves that the immunizing injection should never reach the critical point; it only injures the immunity mechanism. As a general rule, also, there ought to be three clear days between the injections.

Hay Fever and Asthma.—Scheppegegrell³ analyses 707 cases of hay fever, showing that 37 per cent of them developed asthma at some period. In many of these cases the attacks were light and at long intervals. In others the asthmatic attack was so severe and frequent that it formed the predominant feature of the disease. He states that the treatment of hay-fever asthma, during acute exacerbations, does not differ from that in other forms of asthma. The diet and hygienic regulations are also similar. The immunizing treatment, however, in both the prophylactic and curative forms, is conducted on the same principles as that of hay fever. After the diagnostic test has determined the form and degree of the sensitization, 20 units of the indicated **Pollen Extract** are injected under the skin of the arm, the site having first been sterilized with iodine. The injections are repeated at intervals of

two or three days, being increased by 10 to 15 units until the maximum dose is reached, which, in most adults, is 150 to 200 units. This number should be used as long as indicated. The doses for children should be in the usual proportion for their ages. Marked reactions indicate that the doses should be more gradually increased, or even reduced. These reactions consist of slight hay-fever attacks, and occasionally of a more or less general skin eruption resembling miliaria which may persist for several days. When the symptoms indicate catarrhal complications, a Vaccine, preferably autogenous, should be substituted for one to four doses of the pollen extracts.

The results of treatment in this form of asthma due to hay fever are approximately the same as in the uncomplicated form—viz., 45 per cent seasonal cures, 43 per cent improvements, and 12 per cent without benefit.

When the immunizing treatment has been successful, as indicated by a negative skin reaction, and the asthma persists, this shows that there are other excitants for the paroxysms, and a careful examination should therefore be made to determine the cause.

Protein Sensitization in Asthma and Hay Fever.—A preliminary report is made by Sandford⁴ on the work done thus far on protein sensitization in asthma and hay fever in the Mayo clinic. Tests have been made on more than 800 patients during the past two years. Of this number, more than 500 were entirely negative in their skin reaction. The reactions of about 100 more were doubtful. The remaining patients, more than 200 in number, had definite skin reactions. Twenty-eight persons reacted positively to some of the animal emanations. The largest number of reactions was to horse dander. One hundred persons reacted to one or several of the proteins derived from foods. The greatest number of reactions was to egg-white; eleven patients in all were sensitive to this protein. Twenty-five patients had marked positive reactions to grain. Twenty-eight patients were sensitive to vegetable proteins; this group, on the whole, is negative. Fruits, apparently, have little to do with asthma; in several instances banana gave marked reactions; twice it was known to be a definite factor in producing asthma. In 365 tests to *Staphylococcus pyogenes aureus* and *Staphylococcus albus* there was not a single reaction. Of the patients sensitive to ragweed and other fall pollens, 52 were definitely positive, 36 with hay fever and 16 with both hay fever and asthma.

Emetin in Asthmatic Attacks.—In two cases described by Le Clerc,⁵ pulmonary emphysema was responsible for attacks resembling asthma in two boys of 10 and 14. He arrested the distressing attack with Tartar Emetic, and then continued treatment with injections of from 0.02 to 0.04 gm. of Emetin daily for five days, suspended them for five or ten days, and then recommenced. The mother continued to give the injections to the younger boy whenever there were symptoms of returning respiratory disturbance, but after eighteen months they were not needed. When last seen, nearly three years later, the child had apparently outgrown the tendency. This use of emetin is comparable to that recommended by Ramond in chronic bronchitis.

For the employment of *Aspidosperma*, see p. 5; and Tutin, p. 21.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1920, April 17, 1128; ²*Brit. Med. Jour.* 1920, i, 567; ³*N. Y. Med. Jour.* 1919, Aug. 30, 357; ⁴*Jour. Amer. Med. Assoc.* 1920, May 15, 1424; ⁵*Ibid.* Aug. 28, 637.

ATLAS, FRACTURE OF. (See SPINAL SURGERY.)

BACTERIAL LIFE-CYCLES.

O. C. Gruner, M.D.

Bacterial morphology continues to support the view that the existing theories about the life-history of bacteria require re-examination. As long as it is supposed that bacteria only multiply by fission, many phenomena about

infectious diseases must remain anomalous. Mellon¹ seeks for evidence of other phases of life-cycles, and quotes Hort, who has brought to light many important points about meningococci, the colon-typhoid group, and typhus fever. The details of all this work may be read in the paper quoted, but a few words will suffice to show the extreme importance of the conception; it brings suggestive explanations of a number of diseases customarily regarded as distinct, but almost certainly mere variants of one disease. As Mellon says, "the primitive view of an unrestrained plasticity of bacterial protoplasm gave way to the theory of fixity or immutability of bacterial types", and as long as "the purely medical bacteriologist interests himself solely in pathogenic organisms" he prevents himself from seeing intimate connections between infection and the general world of nature outside.

The following objections to the theory of immutability of bacterial types have been brought forward: (1) The meningococcus does not induce cerebro-spinal fever in monkeys; where disease has been set up it has been a meningitis, and not the complete disease; when meningitis has been successfully produced it has been at the expense of 'colossal' doses; cerebrospinal fluid contains a filterable virus which will induce fever without the meningitis, and from the filtrate meningococci can be obtained; 'giant cocci' have been found in the spinal fluid which are apparently parents or sources of meningococci by way of endosporulation. (2) Lohnis is quoted as showing that all bacteria studied by him pass alternately through an organized and an amorphous stage, the latter giving rise to 'regenerative units' and these to 'regenerative bodies'. (3) Tubercle bacilli pass through three stages: non-acid-fast bacilli, Much granules, Koch's bacillus. (4) Streptothricoses pass through a filterable virus, diplococcus, and finally reach a filamentous or branching form. Sometimes the diplococcus is a giant form. (5) Diphtheria bacilli pass through a coccus phase. Browne² has found a spirillum which reproduces itself as a coccoid. (6) Hog cholera is not induced by the *B. suispestifer* but by a filterable virus, and yet infected animals always show these bacilli.

Hitherto inexplicable features about influenza, pernicious anæmia, and Hodgkin's disease may thus become interpretable.

Lipschütz³ discusses the nature of the filterable virus, and shows that this virus is not, as usually supposed, an invisible agent, but is corpuscular. When the organism enters upon this phase it becomes a very minute, rounded or actually spherical structure, immotile, sharply defined, and about half a micron in diameter. Such a phase holds for cattle-pneumonia, avian small-pox, molluscum contagiosum, variola, poliomyelitis, etc., and the organisms, having entered the body, become enclosed in the much-spoken-of cell-inclusions which have been described in all these diseases. It is important to realize that they do not thrive well unless they are accompanied by septic organisms, which play the part of symbiotics. In smear preparations they are identified when they form small aggregations. Inability to cultivate them is not unexpected when the life-cycle is considered in the manner suggested; they need to get into tissues, and often, as it appears, they need to get into the cell-nuclei, before they can enter on a more tangible phase. Every disease in which cell-inclusions are described must be regarded as of this nature. In molluscum contagiosum they are situated in the epidermal cells, which at once reminds us of the inclusions of the epithelial cells of carcinomata. These parasites are therefore spoken of as possessing 'dermotropism'.

The Chlamydozoa-Strongyloplasmata comprise three types according to the part of the cell in which they make their habitat:—

1. *Zytootikon* group: Molluscum contagiosum, epithelioma contagiosum, trachoma, rabies, vaccinia, chicken-cholera.

2. *Caryooikon group*: Borna's disease of horses, virus myxomatsum of rabbits, jaundice of caterpillars.

3. *Cytocaryooikon group*: Small-pox, paravaccinia.

The accompanying diagram (Fig. 5) will visualize the essential points which are opened up by this field of research. Many scattered papers dealing with 'mutation' may thus be assigned to a logical position. Among these is found the work of Clark and Ruehl,⁴ and from a rather different view-point the experiments which have been published in response to W. Bastian's⁵ plea for a re-examination of the celebrated work on heterogenesis. With such intricate life-cycles before us, there is much to be excluded before older views can be given an appropriate place.

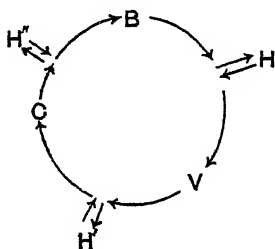


Fig. 5.—The cycle is taken clockwise. The scheme is composite; that is, every phase taken by any organism is catered for; but every organism does not pass through every phase.

B = bacillary phase. C = coccal phase. V = filterable virus. H, H', H' = human hosts (or, perhaps more correctly, warm-blooded hosts—any animal sufficing for this phase).

Reading the diagram, the bacillary phase may infect a human being and a given result occur; it gives rise to a filterable virus, which, in its turn, may infect another person and appear as another disease. In its turn, the virus enters a coccal phase, with or without 'giant-cocci', which may set up another form of disease if it passes through a human being at this point. The organism itself enters on its final stage, which may be (for example) the one with which we are familiar.

Every organism does not go through these phases in this order. For tubercle bacillus there is a B', a V, and a B, the last being the familiar tubercle bacillus. On its way it has caused one person to have ordinary phthisis, another tabes mesenterica, another lupus, another Hodgkin's disease, and so on. For diphtheria the order may be B to C, and C to V, and V to B, but the symptoms which occur in the person who harbours each phase are not those of diphtheria except in the B stage. In another case B = a spirillum. Meningococcus is at B, then comes V, and then perhaps a mycelial stage at C. In other cases the mycelial stage is associated with gonidification, and it is these that become the 'visible' B of the given disease. At the present time the B stage is thought to be the only possible one; and successful inoculation (Koch's postulates) is really an accident, very few organisms being really able to continue in the one phase. Even of these the possibility of re-infecting may be exceptional, and an extra-human cycle not merely a rule but a necessity.

In some cases, V stands for 'strongyloplasmata', which entering the body at H' become visible as 'cell-inclusions', which are shed wholly into the outer world (in pus, ulcerating papillary neoplasms).

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1920, June, 874; ²Program of Ann. Meeting of Soc. of Amer. Bact., Boston, 1919; ³*Wien. klin. Woch.* 1919, Aug. 21, 851, and Nov. 20, 1127; ⁴*Jour. of Bacteriol.* 1919, iv, 615; ⁵*Science Progress*, 1920, Jan. 461.

BAGHDAD BOIL. (See DELHI BOIL; KALA-AZAR.)

BERI-BERI. (See DEFICIENCY DISEASES.)

BILE-PASSAGES, SURGERY OF. (See GALL-BLADDER AND BILE-PASSAGES.)

BILHARZIASIS.

Sir Leonard Rogers, M.D., F.R.S.

F. Milton¹ discusses a statement of E. S. Elgood and T. Cherry² that the special incidence of bilharziasis in children and young adults in Cairo is due to infection while bathing during the observance of the Shem-en-Nesim festival, and points out that this is disproved by the age-incidence being world-wide. He also argues that the relatively low infection of adults is due to a gradual production of immunity as a result of the action of the toxins during the period of nearly universal infection at younger ages, while the much greater severity in adult cases is due to the continuance of the disease in those who have not developed immunity.

W. A. Murray³ reports confirmation of Fairley's complement-fixation test for the diagnosis of bilharzial disease, using the livers of infected snails as the

antigen, and the blood-serum of infected patients, healthy persons not giving the reaction.

TREATMENT.—J. B. Christopherson² once more urges that the now established successful treatment of bilharziasis by **Tartar Emetic** intravenously places in our hands the means of sterilizing all infected patients and so stamping out the disease by preventing infection of the small water-snails which are the intermediate host of the parasite. A. Innes³ records further successful cases of the tartar emetic treatment, which he now accepts as a positive cure, while any fatty change in the liver which may possibly be produced by the drug soon passes away. A total of 15 gr. usually suffices to effect a cure, although there is no danger in going on up to 25 gr. as advised by Christopherson. G. C. Low and H. B. G. Newham⁴ record details of five further successful cases of this treatment, using a total of from 16 to 30 gr. of the drug, the dose being gradually increased from $\frac{1}{2}$ to a maximum of $2\frac{1}{2}$ gr. given in 60 c.c. normal saline solution. F. G. Cawston^{5, 6} reports further successful cases of this treatment in South Africa, and considers the disease is usually cured when the urine has been free from living eggs for two or three weeks. **Codeia** counteracts the toxic symptoms due to antimony salts. Twelve grains is a curative amount.

A. Erian¹⁰ recommends large doses of **Emetine** in treatment, giving 2-gr. doses every other day for four doses with curative effect in one case, while he has since treated 50 cases without a failure with intramuscular injections, beginning with 0.1 grm. and increasing to 0.14 to 0.18 grm.

REFERENCES.—¹*Lancet*, 1920, i, 196; ²*Brit. Med. Jour.* 1919, ii, 494; ³*Ibid.* 310; ⁴*Lancet*, 1919, ii, 634; ⁵*Ibid.* 1920, i, 865; ⁶*Ibid.* 1919, ii, 636; ⁷*S. Afric. Med. Record*, 1920, 168; ⁸*Ibid.* 1919, 315; ⁹*Lancet*, 1920, ii, 392; ¹⁰*Practitioner*, 1919, 391.

BLACKWATER FEVER.

Sir Leonard Rogers, M.D., F.R.S.

J. F. Gaskell¹ records his experience of blackwater fever in Macedonia, and notes that no cases occurred in the Serbian army during their first winter in Salonika in spite of their being very severely attacked with acute malaria, but it appeared among them during the next autumn and winter when they had become saturated with chronic malaria of two seasons, so that the disease only occurred in patients suffering with chronic malaria. Cases occurred in benign tertian as well as in malignant tertian infections, even though the former may have been mild. In chronically infected malarial subjects the disease tends to be a winter one, being predisposed to by cold. The relationship of the attacks to quinine administration was very definite, each patient tending to have a critical exciting dose, while smaller doses were harmless and beneficial; so that in malaria in a patient who has suffered from blackwater fever, smaller doses than that which excited a previous attack should only be given, and two cases were successfully treated for malarial recurrence on this plan. Death may occur from toxæmia or from suppression of urine due to mechanical obstruction of Henle's loops by coagulated hæmoglobin-containing material, to prevent which the blood-pressure should be steadily maintained by the early and continued administration of **Fluid** by every route, including rectal and continuous subcutaneous salines, **Cardiac Tonics** also being used. Quinine should be stopped at once, as the hæmolysis destroys the malarial parasites.

E. Hasell Wright² records cases of this disease in Coorg in Western India, and publishes a number of coloured plates of the parasites found in his cases and one of Donovan's, in support of there being a special piroplasma infection in addition to the malarial one, and he argues at length in support of the view that blackwater fever is a distinct disease due to a special protozoal parasite other than those of malaria.

A. P. Anderson³ records his experience of the disease in Africa, where, in practically every case, repeated insufficiently treated attacks of malaria preceded the attack of blackwater fever, which he therefore agrees in regarding as a complication of badly treated chronic malaria, and he quotes other African opinion in favour of the above view. He records a case illustrating the difficulty in diagnosing the condition from spirillum fever. He has seen cases develop while under treatment with quinine in hospital, but since he has added sodium or potassium bicarbonate to the quinine he has not seen blackwater fever so develop, although his experience of this preventive measure is not yet sufficient to allow of definite conclusions on this point. Three of his seventeen cases terminated fatally. Hearsey's treatment with **Alkalis** and **Perchloride of Mercury** was used, and supplemented by **Rectal Salines**, to which 30 gr. of **Potassium Bicarbonate** was added. **Cardiac Tonics** and small doses of **Morphia**, from $\frac{1}{16}$ to $\frac{1}{8}$ or $\frac{1}{4}$ gr., to combat restlessness and pain, were also given. Quinine is stopped until convalescence is established, when $2\frac{1}{2}$ -gr. doses, gradually increased to a total of 10 gr. in the day, may be given.

M. Houssiau¹ also reports on this disease in Belgian Congo, and differentiates between attacks during severe malaria, in which only he gives quinine, and those occurring in chronic malaria, often with feeble hearts, in which he finds injections of **Camphorated Oil** of value.

A. G. Phear,⁵ with Macedonian experience, agrees regarding the close association of blackwater fever with malaria, although he does not think that quinine is the exciting agent. **Hyosine** $\frac{1}{100}$ gr., with **Morphia** $\frac{1}{4}$ gr., sometimes relieved the symptoms. He found Souttar's apparatus for continuous administration of rectal saline of value in treatment.

REFERENCES.—¹*Brit. Med. Jour.* 1920, ii, 122; ²*Ind. Med. Gaz.* 1920, 161; ³*S. Afric. Med. Record*, 1920, 43; ⁴*Presse mcd.* 1919, Nov., 685; ⁵*Lancet*, 1920, ii, 56.

BLADDER, DISEASES OF.

J. W. Thomson Walker, M.B., F.R.C.S.

Cystoradiography.—Leguen and Papin¹ describe their experience in the use of cystoradiography. They have not found oxygen dangerous, and state that an oxygen embolus is only formed if the bladder is much distended with the gas. To measure the quantity of oxygen injected, the bladder is filled with fluid through a double-way catheter, and oxygen injected through one channel while the fluid runs away by the other. Bismuth in the form of carbonate or subnitrate is used in a 10 per cent emulsion, and does not, as is sometimes stated, produce a calculus. It is, however, quickly precipitated, and falls to the base of the bladder. Collargol in 10 per cent solution is the substance the authors have usually employed. A suspension of iodide of silver has been suggested by Kelly. Barium sulphate in a 10 per cent suspension of olive oil has also been used. Sulphate and nitrate of thorium form a clear solution and are easily used.

The method is useful in many diseases of the bladder. In diverticula the size and relation to the bladder are shown. When the diverticulum lies on the lateral wall, the shadow is seen lying alongside that of the bladder; when it lies on the anterior or posterior surface, it is hidden by the bladder shadow, and can be demonstrated in many cases by getting the patient to empty the bladder voluntarily, when the diverticulum remains full of opaque solution. In tumours of the bladder of large size with severe hæmorrhage and with cystitis, the method is useful in demonstrating the size, shape, and mode of implantation of the growth. The tumour appears rather as a variation in the outline of the bladder when it lies laterally, or as a clear area when it is situated anteriorly or posteriorly. Weakness of the ureteric meatus is sometimes shown by the opaque material passing up the ureter.

PLATE VI.

SYPHILOMA OF THE BLADDER



Fig. A.—Cystoscopic view of right portion of bladder looking toward the trigone and showing vegetating syphiloma. The points of the papillæ are arranged in peaks.



Fig. B.—Cystoscopic view of left portion of bladder, same case, looking toward the trigone.

By kind permission of 'Surgery, Gynecology, and Obstetrics'

PLATE VII.

SYPHILOMA OF THE BLADDER—continued



Fig. C.—Cystoscopic view of right portion of bladder looking toward the trigone and showing vegetating syphiloma of the bladder two weeks after continuous treatment. Ureteral opening plainly visible in crater-like mass.

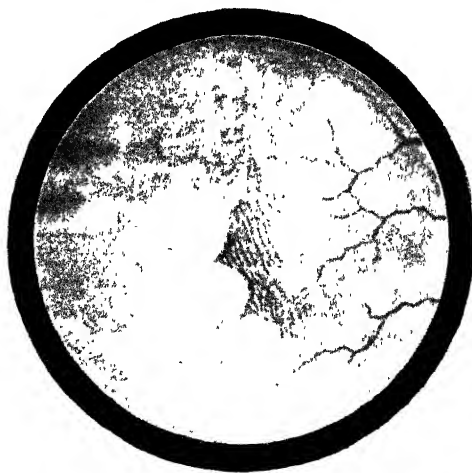


Fig. D.—Cystoscopic view of left portion of bladder looking toward the trigone.

By kind permission of 'Surgery, Gynecology, and Obstetrics'

Blum, Eisler, and Hryntschak² have studied the outline of the bladder under different conditions by means of cystoradiography. The opaque fluid used was potassium iodide. The two conditions of the bladder known as diastole and systole were distinguished by means of the fluorescent screen. The bladder filled in diastole showed a transverse oval form. When contraction of the detrusor, shown by the sudden desire to pass water, occurred, the bladder assumed a circular form, which it maintained until all the fluid was discharged.

Syphiloma of the Bladder.—Danforth and Corbus³ describe a case of vegetating syphiloma of the bladder in a woman of 25 years (*Plates VI and VII*). The anterior wall of the vagina was infiltrated by an infiltratory growth, with many small peaked projections of papillomatous character, together with larger rounded oedematous masses. On cystoscopy there was very extensive infiltration of the bladder wall. Unfortunately a satisfactory microscopic examination was not obtained. A Wassermann blood test was slightly positive on one occasion and negative on another. Treatment by salvarsan caused a rapid improvement in the new growth.

Contracture of the Neck of the Bladder.—Buerger⁴ discusses the pathology and operative treatment of this condition in 17 cases. There may be: (1) A fibrosis of the sphincter of varying depth; (2) Submucous and peri-urethral inflammatory lesions involving the sphincteric region and posterior urethra, and forming a fibrosclerotic sheath of varying thickness; (3) Diffuse glandular invasion of the sphincteric region, with varying fibrosis; (4) Mixed forms of these, with isolated fibromas or adenomas. The treatment Buerger adopts is the exposure by the suprapubic route and removal of a large wedge of the sphincter on the posterior aspect of the internal meatus. Good results were obtained in 13 out of 17 cases. There were 2 failures, and 2 cases improved.

Vesical Calculus.—Barney⁵ gives an analysis of 455 cases of vesical calculi treated in the Massachusetts General Hospital from 1870 to the present time (1919). These include Bigelow's cases of lithotripsy. There were 392 cases of lithotripsy and 63 cases of suprapubic cystotomy. The combined mortality of lithotripsy and suprapubic cystotomy is 9.5 per cent; of lithotripsy alone the mortality is 7.23 per cent, of suprapubic cystotomy 25 per cent. [It appears, however, elsewhere in the article, that in 12 of the 62 cases of suprapubic cystotomy (19.5 per cent) lithotripsy had been attempted and had failed, and suprapubic cystotomy was then carried out. The mortality of these cases could not therefore be attributed to cystotomy as against lithotripsy. Further, no note is made that the cases selected for cystotomy are the worst risks, while those on which litholapaxy is performed are the more favourable cases.—J. W. T. W.] Recurrence after operation took place in 20 per cent, especially after lithotripsy. The average time in hospital after lithotripsy was 11 days, and after suprapubic cystotomy 35 days. There was a steady fall in the number of stone operations from 1900 onwards, due to operations on enlarged prostates and diverticula.

Smith⁶ reports a case of a vesical calculus weighing 38.5 oz. (1,155 grms.) removed from the bladder by operation. This is the largest calculus removed by lithotripsy with recovery that he can find on reviewing the literature.

Covisa⁷ states that urinary lithiasis is very common in Spain. In a collection of 346 cases from Spanish sources, 50 per cent of the cases were children, mostly under 5 years. Stone in the bladder was rare. The treatment employed was suprapubic lithotomy or litholapaxy. Perineal lithotomy was not used. The author operated on 71 patients, performing 73 operations. Of these, 54 were suprapubic lithotomies (30 children, 13 adults), and 2 perineal

lithotomies. No deaths followed litholapaxy. The mortality of suprapubic lithotomy was 3.5 per cent. The predominance of section over litholapaxies is explained by the large number of children. There were 19 cases of renal calculus, 14 of which were operated on as follows: pyelotomy 5, nephrectomy 6, nephrolithotomy 2, nephrostomy 1. There were no deaths.

Tumours of the Bladder.—Rochet⁸ distinguishes three categories of bladder growth in relation to operation: (1) Papilloma, benign in appearance; (2) Papilloma, less benign in appearance, with a tendency to infiltration and with the neighbouring mucous membrane difficult to move; (3) Malignant growths.

The operative treatment of benign papillomata is to cut them away with the scissors. If the papilloma lies at the ureteric orifice, a catheter should be passed into the ureter, traction is made on the growth, which is cut away at its base, and the mucous membrane of the ureter stitched to that of the bladder to prevent stricture.

In dealing with the second class of growth, some of the muscular layer is removed in addition to the mucous membrane, but if there is a suspicion of malignancy the whole thickness of the bladder wall is removed.

When the growth is malignant, and situated at the apex of the bladder, it may be necessary, when it has extended deeply, to open the peritoneum and excise the peritoneal wall on which the growth rests. Where the malignant growth lies in the median portion of the bladder, or the anterior, posterior, or lateral walls, it is still possible to perform a partial resection of the bladder. If the situation is extraperitoneal, the bladder is stripped up and the wall resected. If it lie on the part related to the peritoneum, the peritoneum should be opened above the bladder and the resection should include the peritoneal surface. If the growth lies in the area round the ureter, the ureter should be isolated outside the bladder, cut, and implanted into the bladder wall, and the growth removed. If the growth is very extensive but does not involve the base of the bladder, and it will not be necessary to include the ureters in the resection, it is better to do a partial resection than a total cystectomy. Where the growth involves the base of the bladder and the ureteric orifices, but there is an extensive area of the upper part of the bladder healthy, an operation similar to that employed by Young to remove the prostate and bladder base from the perineum in prostatic carcinoma is used; the ureters are isolated and cut, and implanted into the remaining portion of the bladder. If the ureters are cut too high for this to be possible, they are implanted into a new part of the bladder after the operation.

Herbst and Thompson⁹ review the diagnosis and treatment of bladder tumours. The question of malignancy is all-important in diagnosis. If the tumour is benign it can be removed by fulguration, and recurrences or additional tumours appearing later can usually be removed by the same means; whereas if it is malignant it is usually resistant to fulguration, and other means must be used. The microscopic appearance of a tumour is not a certain guide in judging its malignancy, but there are certain characteristics which may be taken as evidence of malignancy in papillary tumours, as necrosis or sloughing, phosphatic deposit, oedema at the base of the growth, intractable cystitis, induration felt by the rectum or vagina, multiplicity or great size of the tumour, and slow response to fulguration; sessile growths, flat warty growths, and extensive velvety patches are malignant. Portions removed through the cystoscope may appear benign while the base is malignant. If the portion removed is malignant, the diagnosis is certain. Buerger adds the following to the well-known microscopic characters of malignancy—cells manifesting irregularity in size and shape; nuclei rich in chromatin, deeply staining,

and of bizarre shape; cells with atypical mitosis, giant cells, and multinucleated cells. The authors favour the use of **Radium** in the treatment of malignant bladder tumours, either following operation or independent of operation. It is important that the radium should be accurately placed.

Kelly and Lewis,¹⁰ in an article on the treatment by radium of cancer of the bladder, review the different methods of treatment of bladder growths, and claim that radium is an effective means of treating at least some of the malignant growths of the bladder. The simplest method in the female subject is the direct application of an emanation tube through a Kelly cystoscope. As a rule the emanation equivalent of a gramme of radium is used, and the treatment is given for from three to ten or more minutes, and repeated from one to four times in a fortnight. Vesical irritation does not occur unless the applications are made directly to the infiltrated vesical wall. The application of radium usually checks the bleeding, but if it fails, a superficial fulguration of the oozing area ends it. The infiltrating type of bladder cancer is more difficult to treat than the raised papillary form. Vaginal radiation in addition to that in the bladder will help by producing a cross-fire. The application of a gramme of radium at one-fourth or one-half inch distance from the vaginal wall for one-half to two hours, in addition to the intravesical treatment, will constitute an average radiation. This can be repeated in from four to six weeks. A third method is applying the radium directly by implanting a tube into the growth. (*See also* **RADIOTHERAPY**, p. 37).

Joseph¹¹ has treated growths of the bladder by the injection into the growth through a ureteric catheter of strong **Nitric Acid** and of **Trichloroacetic Acid**. Very minute quantities (0.1 cm.) are repeatedly injected from a glass syringe through a shortened ureteral catheter. Care is taken that the eye of the catheter is pressed into the growth, so that the normal mucous membrane is not injured.

Richards¹² describes a case of *secondary melano-epithelioma* of the bladder in a man of 45, and can find only one other case recorded in the literature. The primary tumour was a large pigmented mole on the right side of the abdomen near the umbilicus, and there were secondary glandular deposits in the groin glands. Cystoscopy showed multiple areas of black rounded tumours on the right side of the base of the bladder. Two pedunculated tumours were situated on the right lateral wall.

Barringer¹³ records a case of *colloid adenocarcinoma* of the bladder. The growth was removed from the upper part of the bladder, and was believed to arise in allantoic duct epithelium.

Folsom¹⁴ describes two cases of *malakoplakia* of the bladder. Both cases occurred in women, and the symptoms were similar. These were increased frequency of micturition, burning, and difficulty, which had lasted six years in each case. One patient had passed a small piece of tissue in the urine which was reported to be carcinoma, and this patient had 11 ounces of residual urine. On cystoscopy the general surface of the bladder was only slightly inflamed. The trigone and the adjacent areas of the base of the bladder were covered with irregularly placed, smooth, rounded, nodular tumours, varying in size and shape, some round and almost pedunculated, others with broad bases resembling plaques. There was no ulceration. In one case two masses lay at the edge of the internal meatus and caused obstruction and residual urine. A portion removed showed the following histological characters: The surface epithelium was normal. In the mucous and submucous tissues were masses of large oval cells, thickly crowded together, with little stroma. "These cells have a definitely oxyphilic cytoplasm, which is occasionally foaming in appear-

ancec." The nucleus was fairly small, deeply stained, and excentric. These cells were identical with plasma cells. Many large mononuclears and some small lymphocytes were scattered through the mass. No inclusion bodies were seen. Both cases were treated by fulguration, and the plaques disappeared and the symptoms subsided.

Quinby¹⁵ records a case of *dermoid cyst of the vesicovaginal septum* causing ulceration of the bladder with profuse hæmaturia. The diagnosis was made by exploratory operations. In a second case a dermoid cyst of the ovary filled the true pelvis and communicated with the vault of the bladder, causing severe cystitis. He quotes a case recorded by Fagge where renal colic was simulated by bilateral ovarian dermoid cysts.

Cystitis.—Birnbäum¹⁶ records a case of chronic cystitis with contracted bladder where he implanted a portion of the sigmoid flexure 12 cm. long into the upper part of the bladder. The pain and frequent micturition were relieved and the urine became clear.

Anæsthesia in Surgery of the Urinary Tract.—At the National Congress of Medicine in Madrid (April, 1919), Compañ¹⁷ discussed this question. Patients with urinary conditions are in a special class as regards physiological resistance, and the dangers of anæsthesia should be reduced to a minimum. The number of cases where general anæsthesia is most used should be reduced to as few as possible. Ether is the best general anæsthetic, and the anæsthesia should commence with chloroform and ether. Ethyl chloride is preferred for short operations. High epidural anæsthesia, although little employed up to the present time, invites attention, as it easily and efficiently anæsthetizes the pelvic organs. Local anæsthesia is the method of choice in urological operations. In kidney operations general anæsthesia is preferable. Operation on the urethra, prostate, and bladder should be performed under local anæsthesia, induced by nerve blocking around the operation area or by infiltration. Novocain with adrenalin is the anæsthetic of choice for local anæsthesia.

Purpura of the Urinary Tract.—Stevens and Peters¹⁸ describe this condition, basing the description on 37 cases observed in eighteen months in France. There was a history of diphtheria in 2, rheumatic fever in 2, recurrent attacks of tonsillitis in 3, dyspnœa in 8, recurrent respiratory infection in 4. The onset of the urinary purpura was sudden, and the condition fully developed in forty-eight hours. There was marked prostration, malaise, headache, pain in the legs and back, gross hæmaturia, frequency and urgency of urination, dysuria, and pyuria. In all but one case casts were found in the urine at some time. Cystoscopy showed multiple small hemorrhages not associated with ulceration, neoplasm, or calculus. The hæmorrhagic areas were irregular. When gross blood was present at the time of the cystoscopy, blood was seen issuing from both ureteric orifices. The condition is distinguished from nephritis by the absence of symptoms of nephritis, and from ordinary forms of urinary infection by the "comparative absence of pus cells in the urine", the absence of infiltration round the lesions, and the absence of bacteria in the urine.

REFERENCES.—¹*Presse méd.* 1919, Dec. 3, 783; ²*Wien. klin. Woch.* 1920, July 29, 677; ³*Surg. Gynecol. and Obst.* 1920, Sept., 219; ⁴*Jour. Amer. Med. Assoc.* 1919, Nov. 29, 1877; ⁵*Boston Med. and Surg. Jour.* 1919, Oct. 9, 462; ⁶*Surg. Gynecol. and Obst.* 1919, Nov., 481; ⁷*Ibid.* 397; ⁸*Lyon chir.* 1920, May-June, 293; ⁹*Jour. Amer. Med. Assoc.* 1920, Jan. 10, 91; ¹⁰*Surg. Gynecol. and Obst.* 1920, Sept., 91; ¹¹*Centralbl. f. Chir.* 1919, Nov. 22, 931; ¹²*Surg. Gynecol. and Obst.* 1919, Sept., 266; ¹³*Ibid.* 1920, Jan. 20, 86; ¹⁴*Jour. Amer. Med. Assoc.* 1919, Oct. 11, 1112; ¹⁵*Ibid.* Oct. 4, 1045; ¹⁶*Münch. med. Woch.* 1920, July 16, 841; ¹⁷*Surg. Gynecol. and Obst.* 1919, Oct., 247; ¹⁸*Jour. of Urol.* 1920, iv, 1.

BLOOD, BACTERIOLOGY OF.

O. C. Gruner, M.D.

A good review of the subject has been given by Libman.¹ He recommends that the old terms septicæmia and pyæmia should be abandoned; it is better to speak of bacteriæmia, with the prefix cryptogenic for those cases in which the primary source is not detected. For pyæmia he uses the term metastatic infection. Infections should be classified as local, general, and terminating. This classification is based on the presence or absence of organisms in the circulating blood. The blood-culture is practically always positive in acute infections of the heart. Infections in the portal area need not give positive cultures in the general circulation. Even if a culture prove positive, it is necessary to be sure that it represents the infection really at work, or is simply the evidence of intercurrent traumatic or terminal infection. In every case of bacteriæmia the focus must be searched for; it is this that needs treating, not the blood condition. Bacteria, as a rule do not multiply in the blood; they are being continuously thrown into it.

REFERENCE.—¹*Med. Record*, 1919, Nov. 15, 816.

BLOOD, CHEMISTRY OF.

O. C. Gruner, M.D.

NORMAL.—A number of presumably healthy persons were studied by Hammett¹ in order to determine what variations occur in the chemical composition of human blood. He found variations occur week by week in a given individual, although each analyzed constituent tends to have its own degree of variation. Beginning with the least variable constituent, the following is the order of variability: creatinin N (100), non-protein N (125), total N (129), creatin N (158), sugar (188), uric acid N (204), amino-acid N (210), urea N (227), rest N (275). The variations are taken to represent differences in 'metabolic stability' between the individuals. As regards the variations according to time of day, it was found that there is slightly lower metabolism before breakfast. In forming an opinion on the metabolic state it is necessary to consider the whole blood-picture rather than notice the amount of any particular constituent.

Falta and Richter-Quittner² find that the sugar, the free and combined chloride, and the non-protein N occur in the plasma alone—not in the corpuscles.

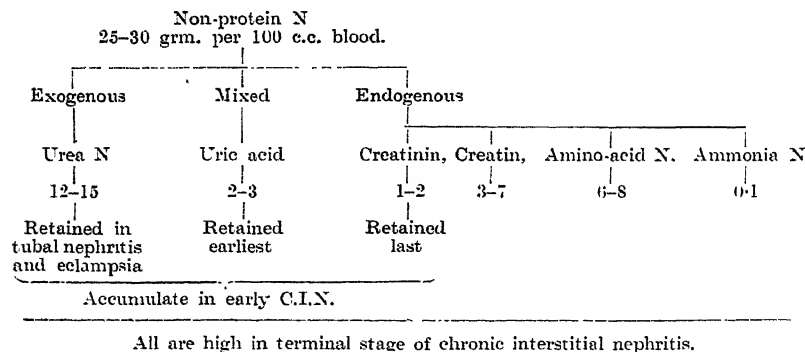
PATHOLOGICAL.—Victor Myers³ has considered all the aspects of technique, and studied the blood very fully from this point of view in various conditions. The development of this part of clinical pathology is essentially American, and the most conspicuous names are those of Folin, Benedict, and Van Slyke. To Folin we owe a method of determining all the important chemical components from merely 10 c.c. of blood,⁴ the advantage of which has been seen in the wider knowledge of various metabolic and intoxicative disorders obtained by routine analysis of the blood. The normal content of various groups of substances has been worked out, the *standard time of collection* being before breakfast, after a fourteen-hour fast. Over and above this comes the determination of the 'threshold value' for each group of substances, a term which assumes that the excretion is a mechanical effect of an accumulation of the particular substance beyond a certain concentration. The alteration of this threshold demonstrates the particular type of disease.

1. Non-protein and Urea Nitrogen.—Normally this is only about 1 per cent of the total nitrogen of the blood, but variations in this constituent give insight into some of the processes of anabolism and catabolism. The kidney normally concentrates the creatinin of the blood 100 times, urea 80 times, and uric acid only 20 times. Hence, if the kidney becomes insufficient, uric acid will be the first to accumulate, then the urea, and the creatinin last. In

deciding to operate on a case of prostatic obstruction, it is advisable to make sure the urea nitrogen is not over 30 mgrm. per 100 c.c. blood. Ambard's co-efficient is no longer considered of any use. The *methods of analysis* are colorimetric. Only 3 c.c. blood are needed for this estimation. Steinfield⁵ has devised a method for bedside determination of blood-urea-nitrogen which gives approximately as good results as Myers'. Fitz⁶ tests cases of chronic nephritis by the phenolsulphonaphthalein test as well as by the non-protein nitrogen in the blood, showing how both become more marked as death approaches.

Uric Acid.—Little advance was made about this subject between the time of Garrod and that of Folin and Denis. The normal amount of uric acid⁴ for a healthy adult is between 2 and 3 mgrm. per 100 c.c. It is increased during the first three or four days of life, also in all forms of nephritis except tubal; in plumbism, cancer, pneumonia, and in some cases of non-gouty arthritis. Uric acid is the first substance to accumulate in the blood. Cincophen and the salicylates induce an increased output of uric acid in the urine, and a decreased concentration in the blood and tissues, by endowing the renal cells with an increased power for eliminating uric acid. Izar⁷ describes four types of uricæmia: (a) alimentary, (b) endogenous, (c) due to fermentative hyperactivity, (d) retention from renal disease, saturnine. Lafranca⁸ classifies uricæmia into (i) functional, (ii) due to disturbance of the equilibrium of the vegetative nervous system—a constitutional vagotonia. The suggestion is that the renal and arthritic disturbances are secondary, and not primary as hitherto believed.

The following scheme (G.) summarizes several points about the non-protein nitrogen:—



Creatinin.—Folin proved that this is endogenous, the amount excreted day by day being constant for the individual. It is an index of the amount of active protoplasmic tissue. To find a great increase means that renal disease must be far advanced; that is, the kidney permeability is greatly impaired.

2. Sugar.—The average normal is 0.10 per cent. It is diminished in hypo-endocrine function (myxædema, cretinism, Addison's disease, pituitary disease, muscular dystrophy). In this section belong the glucose-tolerance tests, which give a definite clue to the state of the endocrines. These tests only became possible with the invention of a simple colorimetric estimation of sugar. Hourly specimens of blood are taken for three to four hours after a test-meal. Fig. 6 shows typical findings as given by Myers, quoting unpublished observations of Killian. Another chart is shown in Fig. 7.

Associated with this aspect of the work is the measurement of the diastatic activity of the blood, which may furnish information not disclosed by the blood-sugar alone.

Hamman and Hirschman⁹ consider that disturbances of carbohydrate tolerance are quantitative, not qualitative, variations. This opinion is based on a study of the effect of repeated ingestion of glucose. A more or less marked hyperglycæmia results. Levulose is much less active in this respect than glucose. Myers points out that the important thing to ascertain, when one knows a person has severe glycosuria, is the alkali reserve of the body as indicated by the CO_2 combining power of the blood.

3. Lipoid Constituents.—

Cholesterin is in excess in the blood in cases of gallstones, even after operation (Rothschild and Felsen¹¹), indicating that in these cases the liver-function of regulation of cholesterol metabolism of the body is still disturbed. The amount of cholesterin is not proportional to the bile-pigment content of the blood. There is no increase of blood-cholesterol in hæmolytic jaundice. Schnabel¹² has studied the blood-cholesterol in various gastro-enterologic cases, and concludes that estimations afford no help to

diagnosis. Schiller,¹³ studying cases of pregnancy, finds increase of cholesterin in such blood, and attributes it to endocrine changes.

4. Mineral Constituents.—

Rodillon¹⁴ considers an estimation of the chlorides in the blood to afford the best clue to the functional capacity of the kidney. His method is practically a Volhard, following a removal of protein by tri-

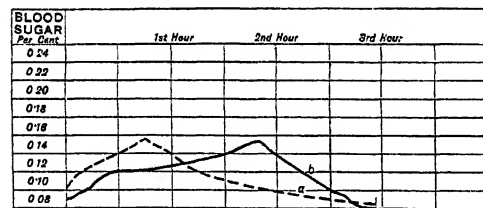


Fig. 7.—Blood-sugar tolerance in (a) health, (b) hyperthyroidism (after F. R. Wilson¹⁵).

chloracetic acid; 15 c.c. serum are needed. The subject is very fully dealt with by Host, of Christiania.¹⁵ He finds that the cause of chloride retention is mainly in the kidneys, which bar the way for these substances, though sometimes the barrier suddenly gives way.

5. The Carbon-dioxide Combining Power.—This gives the most reliable information about the degree of acidosis, a simple test which is afforded by holding the breath (see RESPIRATORY FUNCTION, CLINICAL STUDIES OF). Where the blood is normal the breath should be capable of being held for 30 to 40 seconds. The normal capacity of the plasma for CO_2 is 77–53; 53–40 means slight acidosis, below 31 means severe acidosis.¹⁶ The literature contains various methods of carrying out the estimation, which are chiefly of interest to chemical pathologists.

Connected with this subject is that of the measurement of hydrogen-ion concentration, and of ordinary alkalinity. Rieger¹⁷ measures the acid-fixing power

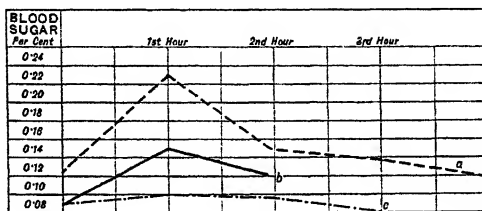


Fig. 6.—Chart illustrating glucose tolerance tests. a, Hyperthyroidism; b, Normal; c, Addison's disease.

of the blood, the so-called 'oxydetic power'; it affords an easy means of detecting impairment of renal function. The method consists in diluting 1 c.c. whole oxalated blood with 9 c.c. 0.85 per cent saline. One c.c. of this is added to each of ten small tubes. To the first tube is added 0.7 c.c. hundredth-normal HCl, to the second 0.75, to the next 0.8, and so on by 0.05 increments. Each tube is shaken at the moment of adding the acid, and not touched again. The reading may be taken in two hours. The last tube which shows the erythrocytes sharply settled in the centre without any sign of hæmolysis gives the oxydetic value of the blood. In good health this value is 100; that is, 0.1 c.c. of blood can absorb 1 c.c. of the acid. The test must be performed within an hour of the blood being drawn.

Bayliss¹⁸ finds that the plasma proteins play no perceptible part in maintaining the neutrality of the living organism. Normally, the sole function of the sodium bicarbonate of the blood is to regulate hydrogen-ion concentration, while the only function of the protein is to preserve a colloidal osmotic pressure and a moderate degree of viscosity of the plasma.

By studying the changes in viscosity of the blood at frequent intervals, Pruche¹⁹ has sought to ascertain how the equilibrium of the blood-serum is maintained when, for instance, large quantities of fluid are taken. He considers there is a readjustment of the chlorides at the moment of absorption, depending on the state of the kidney ('reno-intestinal balance'). By means of such investigation it becomes possible to establish the normal co-efficient of renal excretion of chlorides.

6. Bile-pigments.—There are two thresholds for bilirubin, according to Meulengracht.²⁰ It has to reach a certain level before it passes into the tissues, and a still higher level before it passes into the urine. The method of estimation is colorimetric, the standard solution being 1–10,000 pot. bichromate or 1–300 FeCl₃, 1 c.c. blood being needed. The use of this method enables slight degrees of jaundice to be detected, and is valuable for cases of gall-stones, of hæmolytic and pernicious anæmia, and of certain cases of cardiac insufficiency. Similar results are obtained by Lepehne,²¹ who performs a diazo-reaction on the serum. He speaks of two kinds of bile-pigment, one coming from the liver which gives a prompt reaction, and the other which is 'anhepatic' and only gives an indirect reaction—that is, only when alcohol is added.

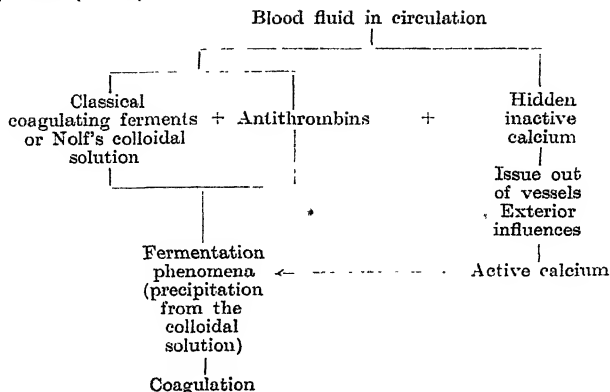
REFERENCES.—¹*Jour. of Biol. Chem.* 1920, 599; ²*Biochem. Zeits.* 1919, ci, 148; ³*Jour. Lab. and Clin. Med.* 1920, March, 343; April, 418; May, 490; June, 566; July, 640; and *Med. Record*, 1919, Nov. 15, 816; ⁴*Jour. of Biol. Chem.* 1919, xxxviii, 81; ⁵*Jour. Amer. Med. Assoc.* 1920, Aug. 14, 473; ⁶*Boston Med. and Surg. Jour.* 1920, Aug. 26, 247; ⁷*Políclínico*, 1919, Oct. 6, 1210; ⁸*Ibid.* 1211; ⁹*Johns Hop. Hosp. Bull.* 1919, Oct., 306; ¹⁰*Jour. Lab. and Clin. Med.* 1920, Aug., 730; ¹¹*Arch. of Internal Med.* 1919, Nov., 520; ¹²*Amer. Jour. Med. Sci.* 1920, Sept., 423; ¹³*Surg. Gynecol. and Obst.* 1919, Nov., 450; ¹⁴*Presse méd.* 1920, Jan. 31, 85; ¹⁵*Jour. Lab. and Clin. Med.* 1920, Aug., 713; ¹⁶*Ibid.* 700; ¹⁷*Ibid.* July, 668; ¹⁸*Jour. of Physiol.* 1919, 162; ¹⁹*Presse méd.* 1920, Feb. 21, 141; ²⁰*Jour. Amer. Med. Assoc.* 1920, Jan. 3, 68; *Ugeskr. f. Læger*, 1919, Nov. 13, 17; *Deut. Arch. f. klin. Med.* 1920, July, 285; and *Med. Sci. Abst.* 1920, May, 197; ²¹*Deut. Arch. f. klin. Med.* 1920, April, 96.

BLOOD, COAGULATION TIME OF.

O. C. Gruner, M.D.

Corachan and Mones¹ confirm the view that the coagulation time is low in persons who suffer from post-operative troubles. They advise Bloch's method of estimation. Bloch² goes into the question of the supply by the various organs of substances helping or hindering the coagulation of the blood. Disease of the liver diminishes the coagulability, so also the kidney, and the lungs when congested (not when inflamed); it is lowered in typhoid fever and in purpuric diseases; it is increased in acute articular rheumatism and in some endocrinous affections. This author views the whole subject of coagulation

from a physicochemical point of view, which is partly expressed by the following table (Bloch):—



The calcium is regarded as playing the same part as the so-called ferments. Calcium is a 'catalyser', and acts in a manner comparable to diastase, which operates not in virtue of chemical constitution but as a special transmissible force, somewhat as one regards electricity and light. The action is due to the colloidal form of the substance: during the whole cycle, calcium, for instance, is in colloidal form during only a part of the time; in regard to coagulation it is 'hidden' during the rest of the cycle.

Other papers on blood-coagulation (Stephan,³ Hanzlik and Weidenthal,⁴ and others) require to be re-read in the light of Bloch's work and suggestions.

REFERENCES.—¹*Siglo med.* 1919, 935; ²*Lancet*, 1920, ii, 301; ³*Munch. med. Woch.* 1920, Aug. 20, 992; ⁴*Jour. Pharmacol. and Exper. Therap.* 1919, 157.

BLOOD, CYTOLOGY OF.

O. C. Gruner, M.D.

In reviewing this part of the subject, it becomes necessary to pay scant attention to a very large number of papers dealing with new modifications of method and with routine counts in patients suffering from various conditions, in order to give due emphasis to two very important works. Both of these were published in 1919, but the more important (Pappenheim's posthumous work on the blood-cells¹) was not available in this country till the present year; the other work (Sajous, *Internal Secretions*²) has passed through many editions without appearing to have much effect on current conceptions, but in the light of Pappenheim's monumental work may now be discussed with advantage. In addition to these treatises, there are numerous papers by Naegeli,³ Stephan,⁴ Bayliss,⁵ Krogh,⁶ Ashhoff,⁷ Loele,⁸ Weil,⁹ Weidenreich,¹⁰ Moffitt,¹¹ Kuczyński,¹² L. B. Wilson,¹³ Mayo,¹⁴ Strauss,¹⁵ to mention only a few. Out of all this literature, coupled with personal observations and reflections, the following account will help to bring something tangible for the use of the practitioner. In constructing this picture it has been found impossible to fix the view-points of the successive authorities used. This accounts for the absence of specific references at various points.

1. Not only are we to cease regarding the various blood-cells as disconnected entities, but the whole vascular formative mechanism can no longer be viewed as an entity detached from the rest of the body. The characters of the blood-cells, so long pondered over in blood-smears, are not fixed, but are ever changing according to certain laws which it is the business of hæmatology to make clear. Every cell which is seen in the blood-film is of a certain age and state of development—which is not to be expressed in fixed units of time (hours, days, weeks) but in terms of its own chronology, which is to a certain extent analogous to that of human beings—infancy, childhood, youth, maturity, old

age. It is well known that some people are mature at 20 and old at 35, others not mature till 45 or even 50, and so on; so with the blood-cells, each has its own time-unit. Then we have to consider that the constituents of a film are not persistently in the blood-stream; an individual is at one time in the stream, at another in the tissues; it has a past history, and it contains within itself the factors which determine its future. The whole is merely a momentary view of a long cinematographic picture. That which is true for the blood-cells is also true for the floating cells of the body. Every tissue and every organ contains some of this universal tissue, which is composed of fixed as well as floating cells. But the fixed cells are not unchangingly fixed. They sometimes become floating also. It is becoming clear that the capillary system is composed of units which are not always mere endothelial cells lining the wall of a vessel. According to this conception we find that even the minute vascular system is in a state of flux, the duration of any particular cell being

Plate VIII.

SCHEMA TO SHOW THE MODE OF DEVELOPMENT OF THE VARIOUS CELLS OF THE CIRCULATING BLOOD. (BASED ON PAPPEMHEIM.)

During the resting state, the ultimate parents of the blood-cells have the form of the endothelial lining of the capillary. They are caused to change by stimuli reaching them in the blood, and then become the parents of the several forms of mother-cell familiar to hæmatology. According to the nature of the stimulus, so the nucleus changes, enabling a distinction to be drawn between the red-cell, the lymphocyte, the leucocyte, and the macrophage series.

Reading the drawing downwards, we find the successive strata show immature tissue-cells (first three rows), mature tissue-cells, and finally blood-mature cells. The mature tissue-cell is the same individual as the mature blood-cell. The successive changes in nucleus and cytoplasm are indicated diagrammatically, in order to bring out the doctrinal part of the subject.

The staining represented is an interpretation, not a copy of actual specimens. The two extremes, basophilæ and oxyphilæ, and the intermediate or mixed forms, are the essentials. The homogeneity of structure, or the reticulation of the cytoplasm, or the appearance of various kinds of granules, is shown.

The essence of the change lies in the fact that the nucleus changes first, then the cytoplasm, and finally granulation appears.

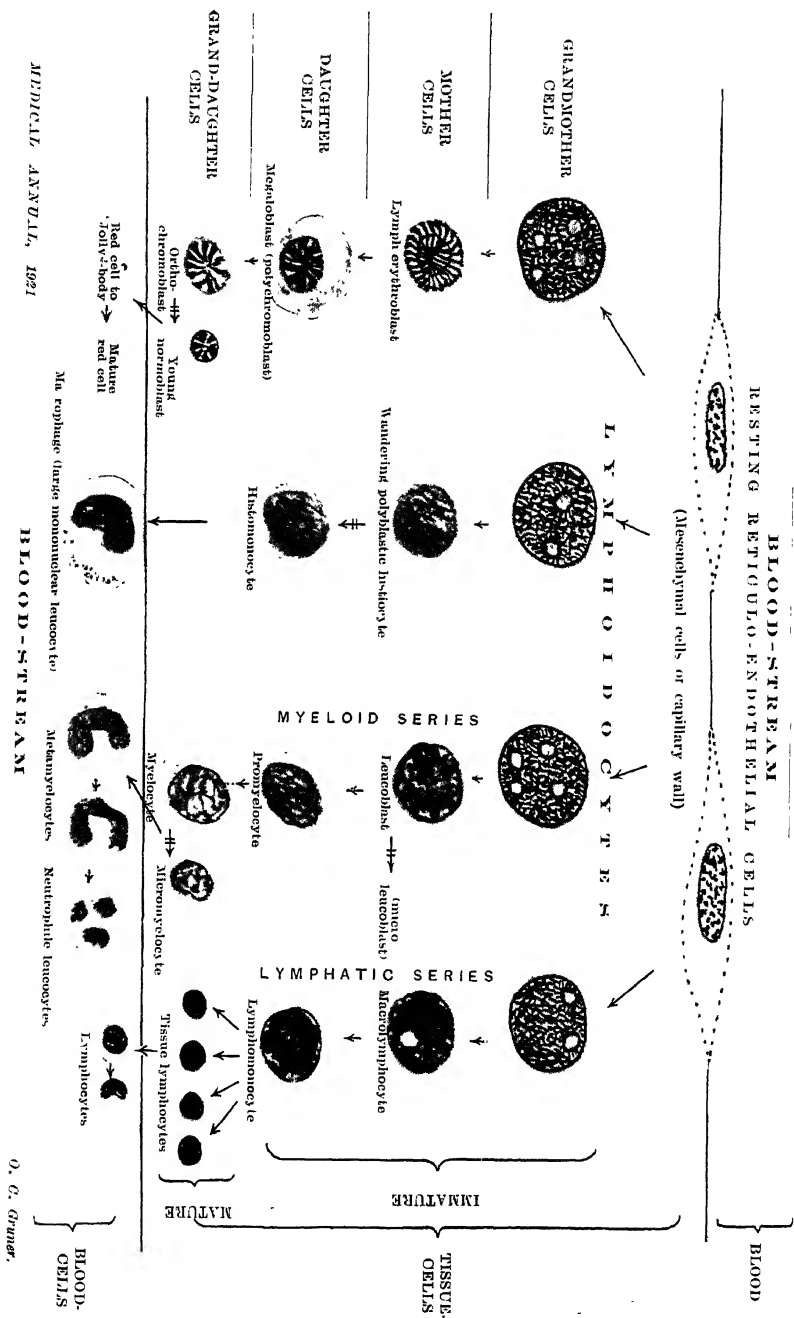
The schema does not show every possible variant found in pathology. Every cell may show the signs of senility, and if not so represented in the drawing may be taken as being pathological when such a character is assumed. Arrows with cross lines on their shaft denote that they stand at a stage where mitotic division occurs.

The drawing also shows the essentials of four different 'tissue-units',¹⁶ namely, the bone-marrow, the spleen, the myeloid, and the lymphatic units. Modifications of nomenclature must be made to indicate that the process occurs sometime in arterial, sometimes in venous, and sometimes in lymphatic body-fluids.—(O. C. G.)

itself variable.¹⁶ Hæmatology, like all sciences, is one which changes because conceptions change,¹⁷ and this last includes one of the most important points which has yet appeared on the field of thought. When the endothelial cell changes, it is in response to certain stimuli,¹⁸ and one of the results of change which may occur is the formation of new cells called inflammatory cell-infiltration.

This aspect may be represented in a diagram (*Plate VIII*), where the upper line shows the edge of a capillary vessel so small that the endothelial cells and the so-called adventitial cells are in the same geographical spot. The movement is downwards in the diagram. First come the mother-cells, from the moment of whose appearance we find ourselves able to speak of a true blood-cell (not a circulating cell, but a tissue-cell). Then, according to the stimulus, this cell is able to follow a certain history. In the plate this is represented by drawing the mother-cell four times, each separate representation being then traced

PLATE VIII.—SCHEMA SHOWING MODE OF DEVELOPMENT OF CELLS OF CIRCULATING BLOOD



out. The granddaughter cells are not fixed, but floating, and when they are 'blood-mature' they make their way into the blood-stream, which is represented horizontally along the bottom of the plate.

What about the familiar idea of blood being formed in bone-marrow? It is evident that in the plate events are represented side by side which in actual fact may occur in different regions of the body. But it is important to note that the capillary forming the skyline of the picture may be (1) arterial, (2) venous, (3) lymphatic. Further, that these processes *can* occur in *any* part of the body. It only happens that bone-marrow shows them conspicuously. The real truth is that there is one blood-forming organ—the reticulo-endothelial system, which *pervades the whole body*, and is localized here and there as lymph-nodes, spleen, hepatic capillary system, bone-marrow capillaries, and is especially widely spread along the whole length of the alimentary tract. Every capillary throughout the body is a potential 'blood-forming' organ. Then, expanding this conception, we find the blood-forming tissues are (1) myeloid, (2) lymphatic, (3) erythroblastic, which are also diffuse through the body. The erythroblastic tissue is related to arterial capillaries, the myeloid to venous, the lymphatic to lymphatic.

Instead of leukaemia being a disease of the medulla or spleen, it is a disease of the diffuse myeloid tissues, or of the diffuse lymphatic tissues (or both), and the cause is some agent which has a special affinity for arterial blood, or venous blood, or lymphatic blood, and also a special affinity for that particular cell-type. Whatever the stimulus be, it is some form of poison which bathes the basement membrane of the capillaries. Will it cause the cells to loosen and become wandering? Will it make them proliferate, and if so in what manner? Is the stimulus going to act on the nucleus or on the cell-substance? The answers to these questions are given by an understanding of the laws to which the blood-cells are subservient.

When we speak of inflammation, with exudation of cells, we are referring to what is really a form of blood-cell formation. At that particular spot there has arrived a stimulus; sometimes it excites polynuclear-cell formation and finally appears as an abscess. Fifty years ago there was a keen controversy between those who asserted the pus was formed *in situ* (L. S. Beale) and those who believed it to be transported by chemotaxis (Cohnheim, etc.). That the pendulum is swinging back to the old point is quite unmistakable in the literature. Both events occur, because the stimulus in one place causes proliferation to take place in the orthodox centres. Reading the plate again, we see it first as a picture of the process at the site of infection, and then as a picture of something going on in other parts of the body. Both things occur practically synchronously. The same cycle of cell-formation has been set going, but the grasp of the genetic processes which *can* take place under all manner of stimuli, alone enables the appearances in histological sections to be properly understood.

That which applies to a miliary abscess applies to a tubercle, and to all kinds of splenomegaly, diseases of the glands, many diseases of the liver, and in fact all so-called 'blood-diseases'. In the abscess, all points along the capillary are growing along neutrophil lines, in tuberculosis all parts are growing along lymphocyte lines, some of which are becoming macrophages (cf. Macklin¹⁹). In various granulomata and chronic plastic inflammations, all manner of cell-forms arise at once at different points.

It is evident, then, that the capillary is beginning to be recognized as a mobile structure which is the seat of active processes. These are not merely vitally important to the body; they are as it were the very seat of life. To speak of an inflammatory reaction is true in one sense, but entirely false in

another. Given normal food-supply, the capillary behaves in this way ; given poisonous material, it simply becomes the inflammatory cell-infiltration : in a few hours if the stimulus goes along the myeloid line, in many hours if it goes along the lymphatic line ; the whole thing is a phenomenon ; this word conveys a subtly different sense, upon which careful reflection is profitable.

So much has been said about the leucocytes that one is exposed to a criticism to the effect that the vastly preponderant red cells receive no place. A few words will clear this up. Every red cell is also at a different age, but it is not easy to detect the differences in a blood-smear. The cells all vary in 'resistance', which is another expression of the same fact. Taken collectively, the total resistance may be measured, and in this case it is found to vary in various diseases. Splenomegaly is generally studied in this regard. The subject is intimately bound up with the question of serology. Bauer and Aschner²⁰ on range of resistance, Berman,²¹ Dreyer²² on the hæmoglobin, and various papers on hæmolytic jaundice and purpura, all provide data which apply to this aspect of the subject.

Plate IX.

SCHEMA SHOWING THE PART PLAYED BY THE BLOOD-CELLS IN NUTRITION. (O. C. G.)

The diagram is read from top to bottom and from left to right. Wandering cells gather food particles from the intestine, and finally reach the capillary near the tissue-cell. The leucocyte (W) elaborates the food taken in into pro-ferment, and discharges ferment granules into the perivascular lymph-space, whence it enters the cell-body as shown by the arrows, finally reaching the nucleus. On its way inwards it meets an outward flow.

The red cell (R) while in the pulmonary capillary becomes charged with oxygen (red rings) and adrenal secretion (via venous blood) (green rings). The two substances are more intimately mingled together than with the matrix of the red cell. Therefore they are represented accordingly. The red cell, having reached the tissue capillary, discharges its oxygen as oxidase, which enters the canalicular system of the tissue-cells, as shown. Making its way to the nucleus it receives nucleins, and passes out through the astropheric region and so outwards in the line of the arrows. In passing out it comes into biological contact with the granules coloured blue, and chemical union takes place.

The canalicular system is the cytotreticulum of histologists. The blue material in the nucleus is basichromatin, the red is the oxychromatin ; the blue granules are the microsomes, which appear in rows because they adhere to the outer wall of the efferent canalicular system.

Nearly every part of the drawing is purposely diagrammatic, so as to represent in one picture practically the whole of Sajous' theories and the views of many 'unitarians' in hæmatology.

2. The next chapter of the story shifts our view of the seat of life to the tissue-cells. After a close scrutiny of the living phenomena presented by the capillary, it is inevitable that the place of the tissue-cell in the scheme must be found. Ordinarily the capillary endothelium only makes aberrant cells in one or two places. To show the place of the tissue-cell in a diagram, the picture of *Plate VIII* becomes *Plate IX*. The food that comes along the capillary is contained in corporate elements familiarly known as blood-cells, red and white. The red cell may be regarded as a body containing hæmatin as in a sort of sponge. It has become activated in the lungs ; previous to that it was only a shadow-cell (as it were) ; it is charged with oxidase ; it comes into the field of vision presented by the diagram, and discharges its ferment as platelet-substance into the perivascular lymph-space. It is drawn through the minute intracellular channels to the nucleus, which is the attracting force. By this means the oxidase meets the nucleins of the cell in the perinuclear space, which acts as a sort of stomach. Then it passes down the excretory system of the cell, meeting on its way the ferment granules which are making their way in from the lymph-space. The result of the meeting is union, and the

PLATE IX.

SCHEMA SHOWING THE PART PLAYED BY THE BLOOD-CELLS IN NUTRITION

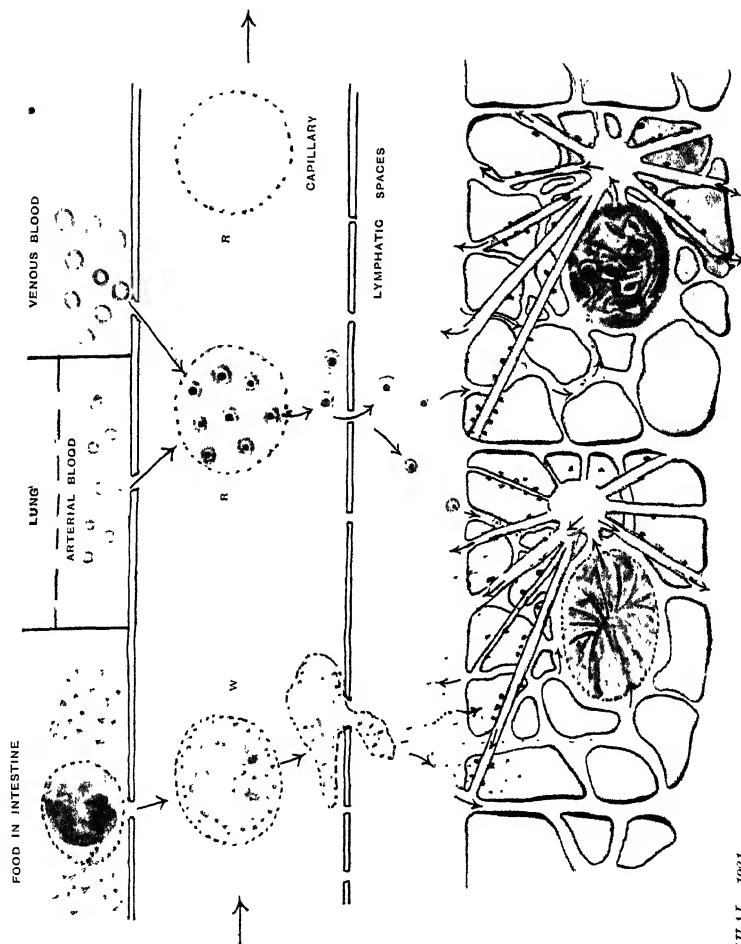
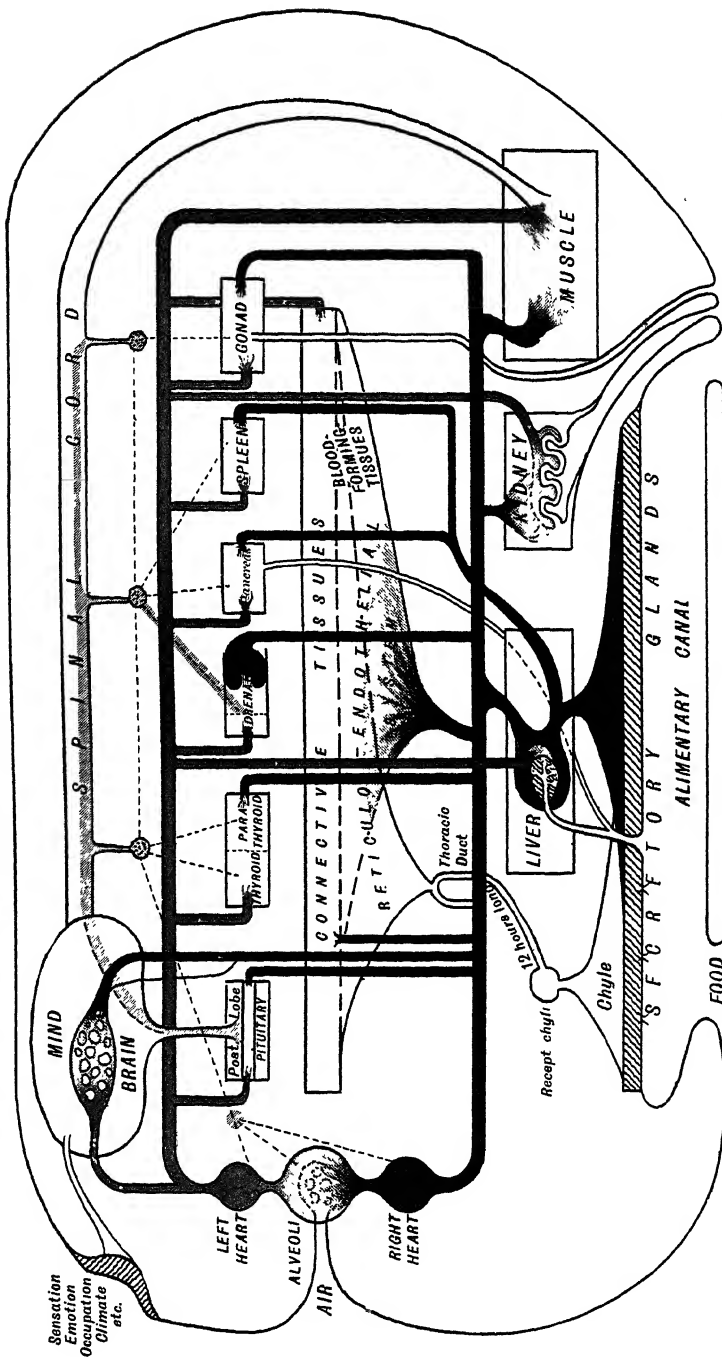


PLATE X.

SCHEMA SHOWING INTER-RELATIONS OF THE BLOOD-CELL-FORMING ORGANS



result of the union is heat, and the result of the heat is the phenomenon familiarly known as metabolism.

The white cells make their way into the space between the capillary wall and the tissue-cell, which is virtually a network of spaces into which the plasma oozes from the lumen of the blood-vessel—having left the cellular constituents behind because they are too big to pass out of the intercellular spaces of the capillary wall (cf. the spaces between the intercellular bridges of the cutaneous epithelium). The leucocytes do not get personally into touch with the tissue-cells either, but shed their granules, which are impelled, spermatozoa-fashion, to enter the tissue-cell cytoplasm. They are actively vibratory. They enter the cell-substance, meet the descending oxidase, and the miniature explosions produce *ipso facto* those substances (derived from the cell-substance, not from the 'ferment') called the waste products of metabolism, which finally pass out of the scene of action depicted, to enter lymphatic channels and ultimately the blood.

Different blood-cells come into play in different organs. Lymphocytes for instance take up iodine, and then are called eosinophils. Some, taking iodine,

Plate X.

SCHEMA DEVISED TO SHOW THE INTER-RELATIONS OF THE BLOOD-CELL-FORMING ORGANS— THE SO-CALLED RETICULO-ENDOTHELIAL SYSTEM.

The main systems of the body are shown along horizontal lines. The endocrines are placed in series beneath the central nervous system. The nutritive organs are placed below, leaving the dominant part of the diagram for the hæmopoietic system, here viewed as the main system of the body.

Each rectangle stands for a corresponding 'tissue-unit' (²³), whose essential features are indicated only in the case of the adrenal and the liver and the kidney. The arterial supply of the digestive tract has been purposely omitted, so as to emphasize this as a portal of entry, both for dietic substances and for toxic substances.

The pituitary is divided into three portions according to Sajous' theory; the thyroid and parathyroid are placed in juxtaposition to illustrate their interdependence. It is seen how, apart from the muscle, the whole of the blood-supply enters the connective-tissue system, thus diffusing over the greater part of the body-volume, carrying with it all the outcome of metabolic activity to fulfill necessary purposes in the special organs during the next circuit.

For other details see BLOOD, CYTOLOGY OF, Section 3.—(C. C. G.)

become lodged in the tissue-spaces of the so-called thyroid, pituitary, and parathyroid, which thus become sponges as it were, the so-called parenchymal cells being really residential or lodging leucocytes.

The depleted red cells become rejuvenated when they reach the lungs again, but in some cases become caught in the spleen-pulp, to be taken up by the endothelial cells and passed on to the liver in these transport waggons. The leucocytes which have shed their granules still wander on and finally reach the walls of the intestine, where they become replenished. Some pick up iron and carry it to the endothelial cells whose business it is to make new red-cells. Hence in the bone-marrow, for instance, we can read *Plate VIII* in terms of *Plate IX*, placing the mother-cell into the position of the tissue-cell, which has to be fed by both red and white cells.

3. The last chapter is that which concerns the linking together of the blood-cell system with all others. This is shown in *Plate X*. Here we find that cells are generated in the intestinal wall, and carry the food particles bodily through the mucosa and into the blood or lymph. In the course of their digestion, their appearance changes. What the histologist calls a small round-cell has become a cell rich in granules and with a lobed nucleus. Some cells

enter the liver, others the thoracic duct. Ultimately both of them pass through the pituitary, which contains a 'test-organ' (Sajous) to pass a verdict on the nature of the substances brought before it. If unfavourable, certain nervous mechanisms are set in motion which are calculated to stop further bad food-material from entering. If the defect of quality is of a kind alterable by the tissues themselves, the endocrine complex comes into play. More adrenal secretion is formed, oxidation is thereby stimulated, and the tissues of the first line of action—the thyroid, the pancreas, and the blood-forming centres—are caused to compensate according to need. Further details will be seen by a perusal of the schema.

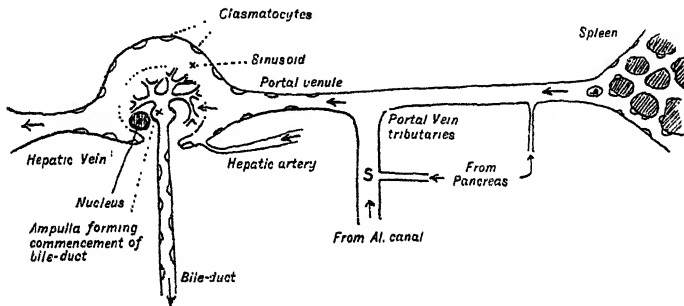


Fig. 8.—TO SHOW THE UNITS CONCERNED IN SPLENIC ANEMIA AND OTHER DISEASES OF THE SPLEEN.

A single liver-cell represented to show the channels by which it is supplied with material, and the intracanalicular channels which emerge as the bile-duct (compare the drawing of the intracanalicular system of *Plate IX*).

Two separate processes occur. First there is the interaction taking place in the space round the liver-cell, bathing it: here pancreatic ferments, oxidase (arterial blood), splenic hormone, splenic phagocytes, carrying iron pigment from the broken-up red-cells, and toxalbumins from the intestine, all meet; reactions occur, and the products pass on by the inferior vena cava. Toxalbumins have disappeared; the hæmoglobin molecule has been restored, sugar and fats and amino-acids lodge in the cell-body, and the surplus sugar enters the nuclear substance, whilst the cholesterolin pass into the bile-canalliculi. The second process is that which occurs in the substance of the liver-cell, which becomes specially involved if the first-named processes do not occur completely (lack of oxidase in the arterial blood; defect in pancreatic ferments; defect in splenic hormone.)

Organisms lodging in the splenic reticulum irritate the endothelial cells in one way or another. Should fibrosis result, the action of these cells is impaired or removed. Should organisms pass on, they may irritate the endothelial cells, interfere with the liver-cell substance, or pass through and enter the bile-canalliculi and irritate the endothelium of these channels, setting up inflammatory disturbance—all according to the form of the organism and other obvious factors. In leukaemia, the agent has set up proliferation in the splenic reticulum; ultimately it sets up the same process in the sinusoids of the liver.

In severe anæmias, the deficiency of oxidase prevents the re-formation of the hæmoglobin in the sinusoid; consequently the effete pigment enters the liver-cell and makes its way thence as urobilin. In other cases, deficiency of oxidase-supply to the liver-cell prevents taurin and glycocholl from being formed, so that there is not enough material in the bile-canalliculi to enable the cholesterolin in them to be linked up; hence gall-stone formation.—(O. C. G.)

It is seen from all these considerations that the white cells are assigned an all-important place in the economy, not—as hitherto regarded—as defences against microbial invasion, but in maintaining the very life of the person. When that life is of a certain pitch of efficiency, microbial invasion cannot take place; it is not a suitable substrate for their development, and therefore there is no need of special 'defence'. The various ferments of the body (*which are not nearly as numerous as biochemistry believes*) all serve to maintain the viability of the leucocytes and of the red cells. The great intermediary between the food we eat and the tissue-cell is the blood-cell. Indeed, we find, on analysis, considering the story of blood-cell-genesis, that the whole body is

made up of only two kinds of cells: blood-cells and tissue-cells. The endocrine mechanism, having been elevated into a dominant position among the tissues, is found to centre in the pituitary, which is virtually now the somatic soul, whose main agents are the sympathetic nerves; whose next dépôts are formed by the other endocrine glands, the agents of which are the leucocytes; and the final dépôts are formed by the cells of the various viscera and the nervous and muscular mechanisms. The tissues come to be passive organs entirely dependent on the efficiency of the other systems.

Many important details necessarily escape mention, and the link between the soma and the psyche is only hinted at (in the plate). The mention of this indicates that the schema is not limited. Sufficient has been given to enable a better assessment to be made of (1) the various papers on blood-counts, serology, and bacteriology of the blood, and (2) the essence of the processes which have received the names of the several blood-diseases. Polycythæmia, Banti's disease, Gaucher's splenomegaly, pernicious anæmia, leukæmias, and the various other symptom-complexes all find their common solutions in the schemes presented in the three plates. Fig. 8, which gathers together a few links of the chain, and shows the details more clearly, will be found to furnish the key not only to cirrhosis of the liver, cholelithiasis, and many common medical ailments, but also to conditions in which that part of the endocrine system is deranged which is fed by the celiac axis artery.²⁴

REFERENCES.—¹*Morphologische Hæmatologie*, Klinkhardt, 1919; ²*Internal Secretions*, 8th Edition, 1919; ³*Folia Hæmatol.* 1919, Nov., xxv. 3; ⁴*Munch. med. Woch.* 1920, Mar. 12, 309; ⁵*Science Prog.* 1919, Oct., 272; ⁶*Jour. of Physiol.* 1919, May 20, 457; ⁷*Verhandl. d. deuts. Pathol. Gesellsch.* 1913, etc.; ⁸*Fol. hæm. Arch.* 1920, xxv, 190; ⁹*Arch. f. mikroskop. Anat.* 1919, xciii, 1 (Studies xii and xiii); ¹⁰*Ibid.* lxxiii, 793; ¹¹*Boston Med. and Surg. Jour.* 1914, Aug. 20; ¹²*Ziegl. Beit.* lxx. H. 9; ¹³*Med. Record*, 1915, Sept. 11, 458; ¹⁴*N.Y. Med. Jour.* 1917, Oct. 27, 795; ¹⁵*Ibid.* 1920, Feb. 14; ¹⁶*Jour. Amer. Med. Assoc.* 1920, Jan. 17, 178; ¹⁷*Jour. Canad. Med. Assoc.* 1920, July; ¹⁸*Practitioner*, 1919, Nov., 381; ¹⁹*Physiol. Abst.* 1920, iv, 478, and *Med. Science Abst.* 1920, May, 194; ²⁰*Deut. Arch. f. klin. Med.* 1919, Sept., 172; ²¹*Arch. of Internal Med.* 1919, Nov., 553; ²²*Lancet*, 1920, ii, 588; ²³*Practitioner*, 1920, Dec.; ²⁴*Bradshaw Lecture*, Dec. 1920.

BLOOD PLATELETS.

O. C. Gruner, M.D.

Gram¹ recommends Oluf Thomsen's method,² which is based on the stability of platelets when held in suspension in plasma. The blood is obtained from the vein. The diseases in which the platelets are greatly reduced are: influenza, typhoid fever, purpura, and lymphatic leukæmia.³ He considers platelet counting and the determination of the bleeding time of extreme importance as pre-operative measures. Cases might be regarded as operable which are really instances of aplastic anæmia.⁴

Degkwitz⁵ proves the independent character of platelets, and shows that their numbers remain constant in health. They are used up when an infection is contracted. They may show reactions apart from the other cellular elements.

REFERENCES.—¹*Arch. of Internal Med.* 1920, March, 325; ²*Comptes rend. Soc. de Biol.* 1920, 505; *Med. Sci. Abstracts*, 1920, Sept., 582; ³*Ibid.* 714, and 583 respectively; ⁴*Ugeskr. f. Læger*, 1920, June 3, 82; ⁵*Folia Hæmatol.* 1920, June, 153.

BLOOD TRANSFUSION. (See p. 21.)

BLOOD-PRESSURE, HIGH. (See ARTERIAL TENSION.)

BOILS. (See FURUNCULOSIS.)

BONE, DISEASES OF. For the value of X-ray diagnosis in these cases (see p. 30).

BONE, EXOSTOSES OF. (See EXOSTOSES.)

BRAIN, ABSCESS OF. (*See* EAR DISEASE, INTRACRANIAL COMPLICATIONS OF.)

BRAIN, SURGERY OF. (*See* CRANIAL SURGERY.)

BRAIN, TUMOURS OF. (*See* CEREBRAL TUMOURS.)

BREAST, SURGERY OF. (*See also* CANCER.)

Sir W. I. de C. Wheeler, F.R.C.S.I.

It is difficult to exaggerate the responsibility of the practitioner who is consulted by a female patient suffering from apparently simple mastitis or definite breast tumour. In the experience of the reviewer, to differentiate between a simple cyst and a solid tumour is often extremely difficult. - The greatest difficulty often arises in border-line conditions in a chronic mastitis in which small lumps can be felt on palpation. While none of the classical signs of malignancy may be present, there is a type of patient, generally a female past 40 years of age, who seeks advice for neuralgic pains in the breast. The gland is enlarged and thickened, small nodules can be found, about the size of peas, which ultimately prove to be cysts, and frequently there is present what may be loosely called a neoplastic diathesis. Warts and moles will sometimes be found on the face and elsewhere, there is perhaps some indefinite history of injury, but at this stage there are no clinical signs of malignancy. The breast is often larger, the nipple is not retracted, the skin is not wrinkled, there are no glands to be felt in the axilla. In four such cases a complete radical operation was performed, and on naked-eye examination of the specimen removed in the operating theatre the clinical finding of non-malignancy was apparently substantiated. In each case, however, a microscopic section revealed early carcinomatous change. It is far better to perform a radical operation which has little or no mortality, and risk an occasional mistake, than to err on the wrong side by using palliative measures or performing local removal in a case of early carcinoma believed to be non-malignant.

Lee and Adair¹ discuss *fat necrosis of the female breast* and its differentiation from carcinoma. They claim that the condition hitherto has been unrecognized clinically. The simulation of carcinoma is startling. In the first case a radical operation was done, the tumour being believed to be malignant, and in the second, after gross examination in the operating room, one of the writers believed he was dealing with carcinoma. Microscopical sections showed broad areas of fat necrosis surrounded by a broad zone of new cellular connective tissue; previous Wassermann reactions were negative. From a study of this paper it would appear very difficult to differentiate between malignant cases and fat necrosis, and probably a number of the latter have been missed. The following points of difference are enumerated:—

1. The history of trauma is more exact and definite than with the average carcinoma.
2. The tumour in fat necrosis is fairly well circumscribed, while the mass in carcinoma is usually more diffuse.
3. The tumour is rather more movable in the breast than is usual with carcinoma.
4. Axillary nodes, if present, have not the hard consistency of those associated with cancer. This differential point would, of course, be of no value in a very early mammary cancer without metastasis in the nodes.
5. The characteristic gross appearances of fat necrosis upon cross-section of the tumour.

The operative procedure in cases of cancer of the breast is now fairly definitely settled. Each surgeon has his own fancy for incision and for minor details, but nearly all start the dissection from the axilla and back towards the

sternum. The tendons of the pectoralis major and minor muscles are divided, and the section of blood-vessels is primarily made, within the axilla. The lymph-nodes and axillary fat are lifted out in connection with the tumour before the cancer of the breast is handled. Hæmorrhage is reduced to a minimum.

Willy Meyer² feels that it must be better for the patient if the space between the pectoral muscles is not entered and the entire diseased area is excised in its normal anatomical relation. He refers to Paget's disease as the most malignant of all cancers of the breast known to us. He does not think that involvement of the supraclavicular glands presents a contra-indication to operation. Many cases are recorded of patients who have remained well for a number of years after the extirpation of these glands. He says that to his mind statistics regarding the results of the radical operation for cancer of the breast are worthless. They do not prove anything. What *does* determine the fate of the patients is the so-called virulence of the disease. One and the same surgeon may do an equally radical operation in two seemingly early or apparently equally far-advanced cases; and one may remain well and free from recurrence for, say, twenty-five years, while the other may develop a regional recurrence and metastases within a few months. All we can say is that cancer, being a local disease in the beginning, may be cured by radical operation if done at an early stage.

Prophylactic Post-operative Treatment of Cancer.—Blumenthal³ finds that raying of the field of operation can only destroy remaining cancer-cells, but does not necessarily prevent recurrence. The local tendency of the tissues to cancer production still remains. Irradiation must be sufficiently intensive, for by inadequate excitation avirulent cells may become virulent. It might be better, after operation for cancer of the breast, to ray also the sternum, the pectoral region, and the supraclavicular and infraclavicular fossæ. At first the sittings should be four weeks apart; later three months. Irradiation may have to be continued indefinitely. He has found that small recurring nodules in the skin sometimes react better to radium or mesothorium than to the Röntgen rays. In all operative cases of breast cancer the healthy mamma must be carefully controlled. We should not trust in post-operative irradiation alone, but should use all other therapeutic means: arsenic (intramuscularly or intravenously), extracts made from the tumour removed at the operation, and autogenous exudates.

REFERENCES.—¹ *Ann. of Surg.* 1920, Aug., 181; ²*Ibid.* 177; ³*Abstr. in Jour. Amer. Med. Assoc.* 1920, July 31, 354.

BRONCHIAL SPASM. Benzyl Benzoate recommended (*p.* 6).

BRONCHIAL SPIROCHÆTOSIS.

Sir Leonard Rogers, M.D., F.R.S.

Najib Farah,^{1,3} of Beyrouth, describes ten cases of this disease seen in Egypt; he believes it to be very common and of world-wide distribution. The spirochæte is easily stained by the Ziehl-Neelsen method or gentian violet. The disease is commonly mistaken for phthisis, and tends to become chronic. **Arsenical Preparations** are of use in its treatment. He has used intramuscular injections of 54 per cent of Iodine in Oil, called lipiodol, five to ten daily injections of 2 c.c. being given, followed by ten to twelve doses at intervals of two or three days; very slight pain results. **Chloride of Calcium** was given for hæmoptysis.

P. Nolf² describes a form of foetid spirillar bronchitis, sometimes ending in pulmonary gangrene, which he thinks is a different variety from Castellani's form, the spirillum not being so pleomorphic, but with a number of short

convolutions, and a sinuous form with small convolutions in each sinuosity. It produces high remittent fever, and may develop into bronchopneumonia or pulmonary abscesses. Organic arsenic preparations exert a curative effect, a series of 45 to 60-cgrm. doses of Novarsenobenzol being given at intervals of five or six days. Peptone injection given intravenously every two days may sometimes be added with advantage. All the patients were Belgian soldiers.

C. L. Browne¹ records two cases of this disease in England simulating phthisis. Arrhenal by the mouth did some good, while the spirochætes rapidly diminished and the cough became less on 0.9-grm. doses of Kharsivan up to a total of 1.2 grm.

REFERENCES.—¹*Presse méd.* 1919, Dec., 774; ²*Arch. of Internal Med.* 1920, 429; ³*Lancet*, 1919, ii, 608; ⁴*Ibid.* 1920, i, 1164.

BRONCHIECTASIS. (See also THORAX, SURGERY OF.)

Arthur Latham, M.D., F.R.C.P.

Jex-Blake,¹ in discussing the treatment of bronchiectasis, states that in all cases inversion of the patient, or letting him cough with his head and chest hanging downwards so as to facilitate the emptying of his bronchiectatic cavities, is a serviceable practice, best carried out on waking. For the rest, the treatment of bronchiectasis may be either medical or surgical.

The *medical treatment* aims at combating the infection in the bronchial tubes by antiseptics, the most widely used of which is Creasote. This may be administered in three ways: (1) By the mouth in capsule form; absorbed from the alimentary tract, some of the creasote is excreted into the lungs, and may there act as an antiseptic. Good results do not often follow this mode of treatment, and it has the disadvantage of tending to upset the stomach. (2) By intratracheal injection; creasote, thymol, menthol, or some other organic antiseptic, dissolved in five or ten parts of olive oil, is injected into the trachea through the curved nozzle of the syringe, below the vocal cords, after cocaineization of the pharynx and larynx. A few drachms of the oily antiseptic can be introduced thus daily, in the hope that some of it will gravitate into the dilated tubes and help to sterilize them and their contents. This treatment has not proved strikingly successful. (3) By inhalation; up to a point this method gives admirable results, of a palliative order. The creasote, mixed perhaps in equal parts with eucalyptus oil and oleum pini silvestris, may be given on a Burney Yeo inhaler, worn for many hours a day. A more effective method of administration is to have a small closed chamber in which creasote can be volatilized by heat; the patient, his eyes protected from the pungent vapour by goggles, inhales the white clouds of creasote fumes deep into his lungs. The fumes bring on violent coughing, which empties the dilated tubes, and no doubt also exert a beneficial antiseptic action on their infected and inflamed walls.

The *surgical treatment* consists in the operative removal of many inches each from a large number of ribs over the bronchiectatic lung, in order that it may be made to fall in completely and obliterate the cavities by fibrosis and collapse. The operation is obviously very severe, and it has been practised on the Continent, and particularly Scandinavia, much more frequently than in this country, and usually under local—not general—anæsthesia. It is applicable only to unilateral cases of bronchiectasis, preferably those in which the lower lobe of the lung is involved, and to those not due to bronchial obstruction by new growth or aneurysm.

Lynah² has had good results with bronchiectasis by washing the tubes out by means of the bronchoscope. In one instance the right bronchus was drained

and the lung aerated by the introduction of a long, soft, fenestrated rubber inner tube into the bronchus. There was a bronchial stenosis in this patient, and she wore the soft rubber tube for six months and made a complete recovery. The bronchi may be intubated by the long bronchial intubation tubes of this writer, but the catheterization of the bronchi through the tracheotomy tube is tolerated much better.

REFERENCES.—¹*Brit. Med. Jour.* 1920, i, 591; ²*Med. Record*, 1920, Feb. 7, 215.

BRONCHITIS, CHRONIC.

Arthur Latham, M.D., F.R.C.P.

Becher¹ states that in chronic bronchitis following pneumonia and influenza he has found injections of **Neo-arsphenamine** (neosalvarsan) successful in two cases. One patient had been expectorating profusely for three months. He was given two 0.6-grm. doses of neo-arsphenamine intravenously. The third day following the first injection the daily amount of sputum had increased slightly, from 200 to 225 c.c., but then it fell rapidly to 10 c.c. in two days, and in a day or two more had ceased altogether and did not return. The patient gained rapidly in weight, and looked and felt much better. The Wassermann reaction was negative. In the second case the bronchitis following influenza had lasted for two months, and the sputum had amounted to 200 c.c. daily. It began to decrease the third day following the first injection, and by the seventh day had dropped to 70 c.c., but did not disappear until the twentieth day. There were no spirochaetes in the sputum, and the Wassermann reaction was negative. Becher thinks that it seems indicated to try arsphenamine injections further in similar cases.

On the employment of *Aspidosperma*, see p. 5; and on the use of **Oxygen**, p. 16.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1920, July 3, 69.

BRONCHOSCOPY AND CESOPHAGOSCOPY.

A. J. Wright, M.B., F.R.C.S.

McCrea¹ has examined the physical signs presented by cases of foreign bodies in the trachea and bronchi. His clinical material has been taken from the large series of cases under the care of Chevalier Jackson, the result of whose researches, from a bronchoscopic standpoint, were given in the *MEDICAL ANNUAL* for 1920 (p. 68).

He comes to the following conclusions :—

1. Cases of foreign body in the bronchus are not mere curiosities, but are more common than has been supposed. This is supported by the fact that although Jackson's cases are drawn from all parts of the United States and Canada, yet the number from the immediate neighbourhood is relatively large. In addition, many are seen in which the foreign body has been present and remained unsuspected for months or years. This fact is explained by the frequent absence of acute symptoms at the time of inhalation.

2. The physical signs of value are, especially, decreased expansion on the affected side, the presence of unusually fine 'tissue-paper' râles, and the presence of the 'asthmatoïd wheeze' (*MEDICAL ANNUAL*, 1920). In acute cases the symptoms are frequently those of pneumonia, with dyspnoea, cough, and blood-stained sputum, but signs over the lung are those of plugging of a bronchus rather than pneumonia. In chronic cases the signs are those of bronchiectasis and abscess formation, but confined to a lower lobe, usually the right, which should prevent the mistaken diagnosis of tuberculosis.

3. Certain organic foreign bodies, such as a pea-nut, set up a very acute general process which is fairly distinctive. Other structures, such as metallic objects, cause permanent changes, usually in a lower lobe, and the fine râles referred to above have only been observed in cases of metallic foreign body.

4. The chief errors in diagnosis are to mistake the acute cases for pneumonia and the chronic for tuberculosis. The recollection of the possibility of a foreign body being responsible for the symptoms will help to prevent these errors.

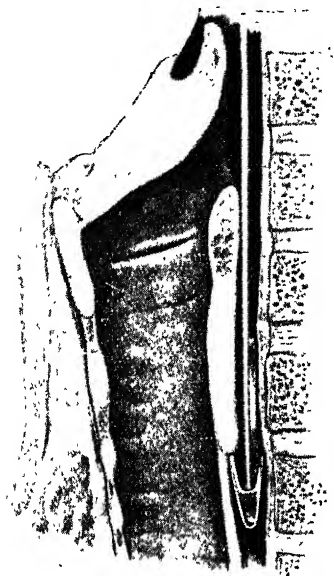


Fig. 9.—Coin-catcher caught under edge of cricoid cartilage.
(By kind permission of Dr. Irwin Moore.)

Irwin Moore² deplors the continued use of the coin-catcher, bougie, and probang in the treatment of foreign bodies impacted in the air and food passages. He relates from the literature a number of cases in which accidents have occurred with the use of the coin-catcher. Portions have broken off, the œsophageal wall has been lacerated, and the coin, instead of being removed, has been forced through the mucous membrane. Fig. 9, showing the catcher caught under the projecting lower edge of the cricoid cartilage, thus preventing its removal, illustrates one of the more frequent accidents. The perfecting of endoscopic methods should have rendered obsolete methods which have been responsible for many fatalities, and the future resting-place of the coin-catcher should be the museum.

For X-ray diagnosis of non-opaque foreign bodies in the bronchi, see p. 20.

REFERENCES.—¹Amer. Jour. Med. Sci 1920, March, 313; ²Lancet, 1919, ii. 566.

BURNS.

—Sir W. I. de C. Wheeler, F.R.C.S.I.

The immediate complication of a burn is shock, and the remote complications depend upon sepsis. When the injury is extensive and septic absorption supervenes, there are usually found at death advanced fatty degeneration of the liver, heart, and kidneys, congestion of the lungs, dilatation of the stomach, and ulceration of the duodenum. Shock can be combated by the administration of **Morphia** and rectal injection of 2 pints of saline with 1 oz. brandy; when the condition improves, the patient should be anæsthetized and the burned area washed with normal saline solution and shaved. **Ambrine Wax** as used in the war makes an excellent application; it can be applied with a brush or by means of a spray. Great care must be taken to prevent any water getting mixed with the wax when melting for application. Wax does not burn the tissues at 176°, but the smallest quantity of water present would cause scalding. The burned area should in consequence be dry before treatment commences. When the wax is in a liquid state at a temperature of 140° to 150°, it should be lightly brushed on to the burnt area; on this a layer of pulled-out cotton-wool is laid, and this is again brushed over with more wax; the dressings and bandages can then be applied in the usual manner. The dressings can be painlessly changed in twenty-four hours; the burn is washed with boiled water or saline solution, dried, and the dressing repeated; the pain is immediately relieved, and the change in dressings is painless. If this method is employed, blisters should not be opened.

The preparation used by McGeary¹ is of a waxy consistency with a melting point of 120°. The formula is: resorcinol, 10 parts; oil of eucalyptus, 20 parts; olive oil, 50 parts; petrolatum, 250 parts; paraffin, 670 parts. Melt the petrolatum and paraffin together. Dissolve the resorcinol in alcohol, and add to the petrolatum-paraffin mixture while it is hot to drive off the alcohol. When cool, add the eucalyptus and olive oil.

Hengerer² states that the first consideration of the treatment of burns is the attention to shock. In severe burns the shock is extreme and **Morphia** must be administered. **Digitalis** and **Pituitrin** may be necessary. Shock may be expressed by an acute acidosis, which should be counteracted by the administration of large doses of alkalis; delirium will sometimes cease after this treatment. The next serious consideration is that of toxæmia; as a result of this there may be definite lesions in the heart, liver, kidneys, and lymphatic tissues. He recommends **Paraffin-wax** treatment. The wax is applied hot either by a soft brush or by an atomizer which has been put on the market for the purpose. The burnt surface should be quite dry before the wax is applied; a layer of cotton is placed over the wax, another coating of wax is placed over the cotton, and then another layer of cotton is banded on. Between the dressings, if the exudate is septic, the surface may be sprayed with Dakin's or other solution.

The paraffin treatment of burns is a great advance, but its technique is being improved, and Lieutenant-Colonel A. J. Hull³ describes the precise method he, after much experience, has come to consider the best. The résumé which follows is very much in his own words. The burn is washed or painted with 1-1000 aqueous flavine solution, followed by the application of 'No. 7' paraffin. 'No. 7' paraffin is thus prepared. Melt 678 grms. of paraffinum durum, add 250 grms. of vaseline and 50 c.c. of olive oil, with 2½ grms. of β -naphthol (resublimed). Let the temperature of the mixture sink to about 55° C., then add 20 c.c. of eucalyptus oil; stir and allow to solidify. The burn, which has had an antiseptic solution painted over it as we have said, is dried with gauze or an electric drier. A layer of paraffin is applied at a temperature of 55° or 60° C. A thin layer of wool is placed over the first layer of paraffin, and a second layer of paraffin at the same temperature painted over the wool. A dressing of wool and bandage covers the paraffin dressing, which is changed every twenty-four hours. The paraffin should not be too hot, or the layer will be too thin and will not peel off in a sheet. This dressing protects the epithelium and holds the tissues at rest, but if granulations become sluggish a scarlet-red paraffin should be substituted ('No. 10' paraffin, which takes more trouble to prepare—see the original paper). This treatment obviates pain, sepsis, and other complications, so is generally applicable. No other preparation has given such good results.

O. F. Mercier⁴ says that at the present time it seems to be the consensus of opinion that **Tincture of Iodine** is one of the best, if not the best, of the antiseptics. This is due to the fact that, in addition to its bactericidal action, it has the power to penetrate the skin. With the use of iodine in the treatment of burns the old method of cleaning the wound may be done away with. The iodine should be applied in one large, generous application, or, as the author describes it, in a jet. This is done by sopping it on freely by means of a large piece of absorbent cotton held in a forceps. By this method the duration of the pain is shortened and the infection is reduced to a minimum. An important point is the quality and strength of the iodine, the best being the French Codex or the 10 per cent solution in pure alcohol, 90 degrees. The alcohol must be pure. Following this treatment a simple sterile dressing with gauze compresses is all that is necessary. After the application of the iodine the

wound covers itself with a thick, brown crust which protects the raw tissues completely. When these crusts fall off they give way to a fine, pink, and supple tissue, and in no case did the author observe a retractile scar. Infection is probably the worst enemy in burns, but where iodine is used the temperature drops to normal after four or five days, and remains normal. The iodine should be applied daily.

For burns of the eyelid, to which iodine cannot be applied because of the danger of injuring the globe of the eye, **Argyrol** or **Silvol** is recommended. Healing is much slower here than where iodine is used, and occasionally ectropion results. The treatment must be given as soon as possible after the injury has been received. For burns of the first or second degree the application of iodine is a complete treatment. For third-degree burns it may be applied in the same way, but the destroyed parts become detached, leaving a wound which must be treated by the ordinary antiseptic dressings or skin-grafting. When the burn is covered by blisters, they should not be opened.

Bradburn⁵ classifies burns into those of a lesser type which heal under nearly any treatment, and those which are more severe and more difficult to manage.

For the first type the initial dressings include those which exclude air, such as oils, but preferably wet dressings of **Boracic Acid**, **Bicarbonate of Soda**, etc. For cases with blebs a good type of dressing is 1 drachm each of boracic acid, sodium chloride, and sodium bicarbonate in a pint of water, changed every forty-eight hours.

When there is a raw surface, two methods may be used. The burn should be cleaned up with sodium bicarbonate solution and dried, two layers of paraffin with cotton between them being then applied; or the **Open-air Method** may be used. The latter is thus described:—

Twice daily the burn is immersed in 5 per cent solution of bicarbonate of soda for half an hour, and then dried and dusted with a powder containing not more than 10 gr. of chloretone with compound stearate of zinc. The chloretone is analgesic, and in large doses also soporific. When granulations have formed, strapping with adhesive is highly recommended to draw the edges of the burnt area together, and should be repeated in forty-eight hours.

There are two critical stages in the more severe burns: that of shock and initial toxæmia in the first forty-eight hours, and that of sloughing after an interval of forty-eight to seventy-two hours. Large doses of morphia may be necessary. The patient is kept warm in bed. Glucose and continuous saline solution should be administered by the rectum. When the danger of septicæmia is passed, any of the methods used for treating burns of the less severe type may be used.

*Medical Science*⁶ states that *electrical burns* have no special clinical characteristics until the third degree has been reached; they are usually painless, and without inflammatory reaction or congestive phenomena found in other burns. There is not much suppuration. The part played by the burn is to shield the victim from the effects of the current. The lesions produced at the point of contact increase the resistance at this point to the passage of the current, consequently playing the part of an interrupter, so that the burn, a local effect, tends to avert death.

REFERENCES.—¹*Minnesota Med.* 1919, Dec., 567 (abstr. in *Jour. Amer. Med. Assoc.* 1920, Jan. 3, 59); ²*N. Y. Med. Jour.* 1919, Dec. 13, 988; ³*Jour. R.A.M.C.* 1920, Feb. (abstr. in *Lancet*, 1920, 1, 1096); ⁴*Canad. Med. Assoc. Jour.* 1919, iv, 915 (abstr. in *Surg. Gynecol. and Obst.* 1920, Feb., 108); ⁵*Surg. Gynecol. and Obst.* 1919, Nov., 373; ⁶*Med. Science*, 1920, Feb. 7, 237.

CANCER. (See also under various organs.) Sir W. I. de C. Wheeler, F.R.C.S.I.

The literature on this subject becomes more and more voluminous, but the goal of research workers is as invisible as ever. Taking a broad outlook, it would seem that not one, but many causes are essential to the development of cancer. There is probably, as pointed out by C. H. Mayo, an influence of heredity in the shape of an inherited cell weakness in which extra demands on the cell for division may early exhaust its controlling agent. The change in the cell which causes it to adopt lawless existence is still a mystery. An acid condition in the surrounding fluid appears, according to the same authority, to be essential to cancer activity, and he believes that hot drinks are probably a cause of no little importance in producing cancer of the stomach. Attention is still focused on the possibilities of successful treatment by **Radium**. The emanations are most effective in growths with active circulation; the cells of the blood-vessels are markedly influenced by their action. Division of the cell nucleus is also apparently checked. On the other hand, the **X Rays** act on the cell protoplasm, checking growth, or by rapid action causing epithelial pre-cancerous proliferation. The cell in this case loses its controlling granules through the rays' action, but, retaining its nucleus cytoplasm, becomes malignant when surrounded by the proper biochemic fluids. Thus cancer can be both controlled and produced. With regard to the action of radium and α rays, it is probable that the scar-tissue produced delays the advance of the growth but renders late operation more difficult. One woman in eleven and one man in thirteen dies of cancer. Education of the community is needed with regard to the danger of chronic irritation in any part of the body. Public attention should be called to the fact that pain is usually a late sign of cancer, and that such simple precautions as good dentistry may eliminate the possibility of cancer of the jaws and tongue.

According to W. J. Mayo, it seems to be a well-established fact that, in countries in which the breasts are allowed to remain exposed to the air without covering, cancer of the breast is comparatively rare, and the incidence is in direct ratio to the amount of covering of the breast and the pressure exerted on it.

Great care must be exercised to avoid transplantation of malignant cells during operation. Manipulation of the growth loosens cells, which become grafted and take on growth upon any denuded surface. A very interesting example is recorded in *Papers of the Mayo Clinic*, 1919. Adenocarcinoma of the ovary is due in many cases to spontaneous grafting of cells having their origin in cancer of the stomach. These cells are grafted to the break in the ovarian surface due to the discharge of the ovum. The rapidity of growth in the pelvis masks the primary disease in the stomach. Transplantation may occur by gravity to the bottom of Douglas's pouch, the malignant cells becoming attached to the terminal epiploic tags. The nodules can be felt on rectal examination, and metastatic carcinoma is then suspected. Traumatism of a cancer-bearing area during operation causes detachment of cancer-infected thrombi into vascular channels, resulting in post-operative carcinoma of the liver and lungs.

Simmons and Daland,¹ in a paper on *cancer and factors entering into delay in its surgical treatment*, come to the following conclusions:—

1. The symptoms of cancer are dependent on the organ attacked. There are few symptoms characteristic of the disease itself in its early stages.

2. The rapidity of the growth varies within wide limits in the organs attacked, and what may be termed long duration in cancer in one situation is short in another.

3. The average duration of the disease in all cases on their admission to a hospital is 12.49 months. The duration may be divided into three periods:

(a) The length of time from the first appearance of symptoms to the first consultation with a physician, representing delay on the part of the patient; (b) The time from the first consultation with a physician until an operation is advised, representing delay on the part of the physician; (c) The time elapsed after the advice for operation is given until the patient enters the hospital, representing a second period of delay on the part of the patient.

4. The delay on the part of the patient after the onset of symptoms before seeking medical advice is 5.4 months. It varies considerably with the situation of the tumour and the rapidity of its growth, but has little relation to the character of the first symptom.

5. The average delay on the part of the physician before advising operation is 3 months. The great majority of physicians in this community recognize the condition and advise operation promptly. The delay in carcinoma of certain regions is longer than is justifiable, however.

6. There is practically no delay on the part of the patient after operation is advised. The advice is accepted and arrangements are made for operation at once.

7. In only 44.5 per cent of the cases of cancer admitted to a general hospital is there any hope of cure by a radical operation. The operative mortality in these cases is 15 per cent, sepsis, shock, and pneumonia being the chief causes of death in the order named.

E. Watson-Williams³ gives an account of the treatment of inoperable cancer by Selenium. There are various preparations of collosol selenium on the market. They may be given by intravenous or intramuscular injection; the intravenous route is to be preferred. The general reaction is never alarming. The following scheme is suggested: a dose of 5 c.c. on the 1st and 3rd days, followed by 10 c.c. on the 5th, 8th, 10th, and 12th days, then a month's rest, to be followed by 10 c.c. twice a week until a total of 100 c.c. have been administered in all. Some local, focal, and general reaction is to be expected. It is claimed that in favourable cases there is diminution of tenderness, cleansing of ulcerating surfaces, diminution in size and hardness of the tumour, increased mobility of the part, and general improvement in the condition of the patient. In inoperable cases the results obtained compare favourably with any known method of attacking the growth by the blood-stream. The preparation appears to be more active than copper given as cuprase, etc. There seems to be no positive contra-indication to this preparation. The result is summarized as follows: (1) In a class of patients whose outlook has till recently been almost hopeless, a very considerable degree of benefit may be expected; (2) Pain, sleeplessness, ulceration, and discharge are markedly diminished; (3) In favourable cases a fair degree of comfort is attained (several returned to work); (4) In a few cases the degree of relief comes within measurable distance of a 'cure'.

Use of Proteal in (p. 19). Radiotherapy (pp. 33, 34, 36).

REFERENCES.—¹*Boston Med. and Surg. Jour.* 1920, Sept. 2, 298; ²*Brit. Jour. Surg.* 1920, July, 50.

CANCER, CLINICAL PATHOLOGY OF.

O. C. Gruner, M.D.

De Niord and others¹ have studied the effect of Röntgen rays on the metabolism of cancer patients. The state of metabolism is gauged from estimations of urea, creatinin, uric acid, chlorides, cholesterol, fatty acids, total fats, sugar, diastatic activity, and plasma and corpuscle percentage in the blood. The patients selected were free from renal disease. Controls were made with normal people. In the discussion of results, each of the elements of the examination is dealt with separately. The fatty acids and total fats and cholesterol

are increased in cases of malignancy, but whereas the first group is increased still further by x -ray treatment, the other two groups are diminished. The increase of cholesterol is therefore attributed to cellular autolysis, which is accelerated by exposure to x rays. No other chemical change was noted in these experiments.

Luden² has found that the estimation of cholesterol requires to be made with considerable care, and must be done by a uniform method. The content of the blood is influenced by the diet, the rate of basal metabolism, bacterial infection, hæmorrhage, radium. The cholesterol is intimately related to lipid metabolism, and to carcinoma.

Körtschoner and Morgenstern³ have studied the Freund and Kaminer reaction by means of the refractometer. An increased reading was found in fifty sera where there was no fever. Fever decreases the reading.

Budde⁴ has made experiments with cancerous sera, which sometimes give clinical reactions when injected into cancer cases, and sometimes do not. The potency and mode of action of the sera varies according to whether the nature of the tumour used as antigen is of the same nature as the patient's tumour or not.

Solorzano⁵ has applied the Abderhalden reaction to the urine as a means of diagnosing cancer. Five c.c. urine are dialyzed by a simple appliance, and after twenty-four hours treated with 10 per cent soda. Finally, three or four drops of 5 per cent copper sulphate solution are carefully dropped upon the surface of the liquid. If they sink in ring form, the reaction is negative; if they spread on the surface and finally tint the whole fluid a pink or violet-blue, it is positive. The test is vitiated if there is albumin, peptone, blood, bile-pigments, or other colouring matter in the urine. The procedure must be aseptic.

O'Connor⁶ has found the urine to yield a spontaneous fibrin coagulum in a case of carcinoma of the kidney. He does not ascribe it to the tumour itself, but considers it a sign of renal destruction.

Carter Wood⁷ refers to the diagnostic incision of tumours, saying that the danger of incising one preliminary to complete excision has been greatly over-rated. The manipulation of the growth through the skin is the real source of danger. In several instances extensive operation was obviated by having a preliminary microscopic examination.

REFERENCES.—¹*Arch. of Internal Med.* 1920, Jan., 32; ²*Surg. Gynecol. and Obst.* 1920, Jan., 41; and *Jour. Lab. and Clin. Med.* 1919, 719; ³*Biochem. Zeits.* 1920, civ, 259; ⁴*Centralb. f. Chir.* 1920, June, 611; ⁵*Observador med.* 1919, i, 100 (abstr. in *Surg. Gynecol. and Obst.* 1920, June, 455); ⁶*Amer. Jour. Med. Sci.* 1920, May, 729; ⁷*Jour. Amer. Med. Assoc.* 1919, Sept. 6, 764.

CARBUNCLE.

E. Graham Little, M.D., F.R.C.P.

Scott¹ advocates the elimination of the entire mass by **Actual Caution**, which is passed under the carbuncle as well as round its edges. If vessels are not occluded by burning, they should be tied. Burned tissue is cleared away and skin-grafts are applied.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1920, Jan. 17, 201.

CATARACT. (See also EYE AFFECTIONS, GENERAL.)

J. Burdon-Cooper, M.D., D.O.

MEDICAL TREATMENT.

The medical treatment of cataract is a subject of which we have not heard the last. Although potassium iodide and other drugs have been tried empirically for this affection, and all but potassium iodide have been given up, and although Fuchs and others have proclaimed the absolute inefficiency

of internal treatment, the subject still attracts attention, and not without reason. We have authors now admitting that the future of cataract treatment lies along medical lines (Márquez, Colomo, and Soria¹), not those based on discredited agents, chiefly the iodides, but along the lines of immunotherapy and the application of the theory of antigens and antibodies. Márquez, Colomo, and Soria immunized a donkey by repeated intravenous injections of the crystalline albumin of the ox's eye, and in this way obtained **Phakolytic Serum**. In the experiment, a traumatic cataract was produced in a rabbit, and the phakolytic serum was injected into the traumatized eye; resorption occurred more rapidly in the eye so treated than in the control. The production of antibodies following the injection of phako-proteid was demonstrated years ago by Megas, Moreno de Vega, and Sauchez Gruas at the suggestion of Márquez. The latter suggests that possibly an antigen or antiphakolytic serum might be obtained which would protect the crystalline against factors causing cataract. It may be said at once that no sound line of treatment will be forthcoming until the chemical pathology of cataract is better understood—otherwise all methods must remain empirical.

In this category must be placed the extremely interesting and valuable paper on the action of **Radium** in cataract by Martin Cohen and Isaac Levin.² This paper should be read in the original by those interested in the subject. The authors utilize the selectively acting gamma rays. The radium was covered with brass, photographic paper, and gauze, and placed over the closed eyelid 2 cm. from it, the application lasting two hours. Charts giving the detailed history of each case, with coloured figures showing the condition before and after treatment, add to the value of the article; they are too large for reproduction in the pages of the **MEDICAL ANNUAL**. Definite improvement was shown in 87.5 per cent; visual acuity was improved, opacification was less, and better illumination of the fundus was secured; early small cataractous formations may be cleared up by this means. In conclusion, the authors state that the application of radium to the eye is harmless, and that opacifications diminish under its influence; no difficulties present themselves if operation has to be undertaken.

At the discussion following the above paper, the experience of some very well-known American ophthalmic surgeons was given. Greenwood, of Boston, speaks favourably of **Dionin**, using a 1 per cent solution dropped into the affected eye three nights in each week, and after a few months three nights out of every other week: the treatment is based on the power of dionin to produce better lymph and capillary circulation and thus influence nutrition.

Most ophthalmologists recognize that, broadly speaking, cataract is due to a defective nutrition of the crystalline lens. Hess has shown that the epithelium of the anterior capsule is defective, granular and hyaline detritus constituting the liquor Morgagni, and the fibres are eroded where the grey spiculae are found. Damaged fibres cannot be made good; and all that we are able to produce so far is the absorption of the liquor Morgagni.

Weeks, of New York, thinks that improvement in the nutrition of the lens, by improving the patient's general condition and the circulation in the anterior part of the globe, may arrest or even retard some cases; in others no effect is produced. For some years, working on the above hypothesis, he has used **Glycerin**, **Boric Acid**, and **Water**. The glycerin provokes a harmless hyperæmia of the anterior segment of the eye, and being harmless it may be persisted in. **Dionin**, as we know, soon loses its effect, and the stimulation is only intermittent. Weeks stated that his experience with this treatment in 1000 cases showed better results than that by radium.

Park Lewis spoke against the unscientific character of radium treatment

and its empiricism, no consideration being given to the origin of the disturbance. He considered that the lens changes were the result of toxins (teeth and tonsils).

Risley spoke of the importance of uveal disease as a factor (pointed out some years ago by him) in the impairment of the nutrition of the vitreous, crystalline, and cornea. We all realize now the influence of choroidal disease in producing crystalline opacity and vitreous degeneration. Dilatation of the anterior vessels he regards as an indication of uveal disorder, and uveal disease was often but a local expression of some systemic disease, notably cardiovascular with kidney involvement. He considered that the uveal tract was quite as liable as the kidneys to participate in any systemic dyscrasia, and that the treatment of the latter was quite as important as the local manifestations. He makes use of prolonged mydriasis (even in the aged), and often uses at the same time **Physostigmine Salicylate** twice daily, believing that it contracts the blood-vessels and stimulates the circulation. He believes in thorough correction of the refraction and any muscle imbalance present.

Savage believes in **Mercuric Chloride** or **Potassium Iodide** for improving the cell activity in the anterior segment, giving $\frac{1}{100}$ gr. of mercuric chloride and 1 gr. of potassium iodide after each meal for five weeks, repeating after one week of rest. He thinks this treatment checks the changes in their incipency.

Green, of San Francisco, spoke of Smith's (Indian) method—viz., the injection subconjunctivally of 18 min. of mercuric chloride 1-4000—which, after an intense swelling of the conjunctiva, provokes a redness which lasts about a month. An eye-bath of 1 per cent solution of potassium iodide is prescribed every morning and every other night, and on the alternate nights the patient uses 2 per cent dionin drops, gradually increased to a saturated solution. Treatment is kept up for six months. It is of little use if vision is below 50 per cent.

Edward Jackson thought it advisable to investigate early any treatment purporting to influence cataract without operation, as any such claim was all that was necessary to attract public attention to the means employed.

Smith gives **Peptonate of Mercury** systematically with **Sodium Cacodylate**, and also **Iodide of Potassium**. He gets better results with mercury—which he gives intramuscularly—than with iodide. Many years ago Roemer fed patients with the elements of animals' lenses, and thought he got improvement in vision. Königshofer carried out this treatment for three years by lens feeding, but did not get satisfactory results, the iodides being more beneficial. Schumer's experiments on cats were polemical against Roemer. Elzi, reasoning that the lens was epidermal in origin, and considering the influence of resorcin on the epidermis, used $\frac{1}{2}$ per cent **Resorcin** in vaseline, and found the hazy material between the opacities cleared up. Le Roy found that patients with excess of ammonia showed an absence of the thiocyanates, and he gave $\frac{1}{2}$ to 1 gr. of **Sodium Thiocyanate** orally or hypodermically. He reported great improvement. Connor prescribes correction of ametropia, avoidance of eye-strain, soaking the eye three times daily in hot water for ten minutes, vibratory massage to neck and eyes for two minutes three times a week, dionin once a week or oftener, and attention to general health.

While not wishing to be too severe on empirical methods, it must be admitted that the only rational basis of treatment is a sound pathology, and the writer fears this is where our knowledge comes short to-day in cataract generally. Since 1906 the reviewer has worked at the chemical pathology of cataract, and in 1913 showed that senile cataract at any rate resulted from a hydrolysis of the lento-proteid, for in no other way could he account for such bodies as tyrosin and cholesterin, especially the former, in the aqueous

and lenses of cataract patients. Tyrosin also occurs in the aqueous after needling a clear lens. The lens may be hydrolysed by means of an extract of ciliary body, and the writer has by him to-day evidence to show that the aqueous in senile cataract is acid in reaction. He saw some years ago a lens which it was impossible to render opaque by needling, but which in a few weeks became so after feeding on root vegetables, his explanation of this being that the latter supplied some oxydase (which completed the reaction).

The improvement seen in cataracts by the exhibition of potassium iodide, both generally and locally, may possibly be explained on the assumption that potassium is deficient, both sodium and potassium being essential to life, the deficiency arising from some form of acidæmia and robbing of the tissues of their normal alkali reserve. Burge,³ in 1910, from the examination of cataractous lenses, concluded that the normal lens of old age, as compared with the embryonic lens, showed no diminution in potassium and no increase in calcium or magnesium; but in cataract potassium diminished from 38.8 to 9.8 per cent, calcium increased from negligible to 12.5 per cent, and magnesium from 1.2 to 8 per cent; increase of sodium is from 6 to 25 per cent, and practically balances the decrease in potassium. This observation the writer considers of the greatest importance, and one that ought not to be ignored in the medical treatment of cataract.

As there is sufficient in the eye itself to cause an opacity of the lens and hydrolysis of the phako-proteid when the lens capsule is ruptured (the aqueous contains a hydrolytic ferment), the initial cause of opacification must be sought in some interference with the delicate capsular epithelium, as by these cells the lens is preserved from deleterious substances. As potassium is a cell food, and there can be no doubt that potassium is deficient in the cataractous lens, is not the first change a robbing of the capsular epithelial cells of their normal potash, and in consequence depreciation in the vitality of the cells, which are then pervious to ferments and acid substances, with the result that the phako-proteid is decomposed and opacification results? The writer is certain that the cause of cataract is to be found along these lines, and in his hands treatment based on these ideas of the pathology of cataract has given him the best results. Any and every refraction error should be corrected, and the refraction kept accurate. Potash should be administered periodically. Rest, especially from close work, should be insisted on, and the patient encouraged to do what is necessary at intervals. Attention to bowel and kidneys, and the elimination of foci of infection, are essential. An anti-gouty diet, with avoidance of salt meat and soups, offers the best chance of stemming the development of the incipient changes in the lens.

Burge⁴ has written an interesting paper on the injurious effect of ultra-violet rays on living tissues: waves of shorter length than $350 \mu\mu$ are injurious, and it was found that if films of egg-white and of the crystalline lens were partly exposed to the rays from a quartz lamp for twenty minutes, and then placed in 1 per cent calcium chloride, the exposed parts were coagulated, whereas the unexposed were not affected. An extract of pig's lens with 1 per cent calcium chloride was exposed to the radiation from a quartz mercury vapour lamp. Coagulation occurred when the wave length was $254 \mu\mu$ in 50 min.; when $265 \mu\mu$ in 65 min.; when $280-302 \mu\mu$ in 120 min. The cornea transmits waves as short as 297 to $302 \mu\mu$. An extract of lens 1 mm. thick absorbs all waves shorter than $313 \mu\mu$. The aqueous, 1 mm. thick, does not absorb the effective wave-lengths appreciably. Another interesting point elucidated was that the protective action of the cornea is incomplete, and that coagulation of lens-proteid depends on the presence of calcium or silicate in the tissue. A normal lens contains 0.08 per cent of calcium in the ash, whereas in

cataractous lenses the amount may be as high as 15 per cent. The theory of glass-blower's cataract put forward is that the ultra-violet rays modify the phako-proteid in such a way that, if abnormal amounts of calcium salts or silicate are present, they combine to precipitate it, with resulting opacity.

SURGICAL TREATMENT.

Weill⁵ prefers a lance or keratome 8 to 11 mm. in width to the Graefe knife, prolonging the incision on withdrawing the keratome. The advantages he claims over the Graefe incision are that neither counter-puncture nor saw movement is necessary, that the anterior chamber is tight till the completion of the incision, and that it is re-established more quickly. The iris is rarely involved in the wound, and post-operative astigmatism is less. He speaks of an experience of 400 cataracts since 1912.

Catresana,⁶ in spite of the disadvantages in the new suction method of extracting cataract, thinks the method should be proved clinically to determine its indications.

Baraquer y Baraquer⁷ uses 4 per cent nitrate of silver solution for sterilizing the lid surface, wears cotton gloves, stitches the flap, which he considers part of the process, avoids iridectomy—and when this is done, does it peripherally—pays particular attention to the toilet of the wound, secures a graduated miosis, limits the dressings to the operative region, and usually employs sublimate salve for the lids.

Benedict⁸ reviews intracapsular extraction of cataract, its advantages being freedom from iritis and from long reaction periods owing to absorption of cortex, few complications, elimination of after-cataract, short convalescence, visual acuity improved rather than diminished, and shorter hospitalization, a distinct benefit to the aged, who bear it poorly. Smith's Indian method revived the intracapsular operation introduced by Pagenstecher in 1868. Much discussion, for and against, has followed, and attempts to devise a safer procedure have given rise to wide variations in technique, as is evidenced by the numerous instruments devised to remove the lens—cystitomes, hooks, vectis, spoons, glass rods, vacuum extractors, reclinateurs. The objections to the operation are abrasion of the corneal epithelium, and vitreous losses, minimized to some extent by using less pressure and improved lid retractors. In 1910 Knapp began using Kalts' forceps instead of the cystitome, and with it made side-to-side movements of the forceps—grasping the capsule, at the same time making intermittent pressure below the cornea with a Daviel spoon. Benedict has proved that the zonule gives way more easily by pressure below the cornea than by side-to-side movement of the forceps, also that the lens could be raised so as to engage the wound before the zonule gave way. Accordingly traction up and towards the wound, combined with pressure below, is the best method, care being taken that the traction on the capsule is not sufficient to rupture it. When the zonule gives way the lens engages in the wound, without turning; pressure with the spoon is then made, following the lens as described by Toerock, until the lens is more than half out, when its delivery is completed with forceps alone. It soon became evident that some types of cataract were not suitable to this method of extraction. The more successful attempts were made in the case of sclerosed lenses. Cataracts present considerable variation. Some were found with friable capsules and zonula; in such cases the extracapsular method was adopted. Frequently soft white lenses with tough capsules could not be removed intracapsularly. Juvenile and traumatic cataracts present difficulty by this method.

Maddox⁹ recommends, in order to facilitate cutting Thiersch grafts, coating

the skin with collodion or formalized gelatin. He also recommends abstraction of blood from the nasal mucous membrane as a preliminary operation for glaucoma and cataract in hæmorrhagic and dangerously plethoric individuals, in threatening cerebral apoplexy, and in the vicarious hæmorrhages of the menopause. He passes a small keratome up the nostril with its back to the septum, and when sufficiently high turns the wrist sharply. As he hints, it might be more generally applied, and be useful during the crises of fevers and after cerebral concussion.

Colonel Herbert¹⁰ has an important note on the free instillation of cocaine with adrenalin, and of eserine, in cataract extractions, which should be read by ophthalmic surgeons. He states that if, in senile cataract extractions by the simple method, anything nearly approximating extreme dilatation of the pupil were obtainable, the prevention of iris prolapse would probably be more certain than by the use of eserine. Using adrenalin, atropine, cocaine, and again atropine, and then repeated cocaine instillations, a wide dilatation can be obtained, powerful enough to persist, slightly changing after incision has been made.

Wood White and Harrison Butler¹¹ report a case of successful treatment of suppurative after cataract extraction. A combined extraction was done and vitreous escaped. Eleven days afterwards there was a line of pus along the wound, and septic exudate in the anterior chamber. Chloroform was given, and a hot wire was drawn along the line of section, and allowed to burn in the anterior chamber till aqueous escaped. A subconjunctival injection of 1-5000 oxycyanide of mercury and 10 c.c. of antistreptococcic serum were given. The culture from the lips of the incision showed the pneumococcus. Ultimate vision was $\frac{6}{15}$, and the authors are to be congratulated on the result.

REFERENCES.—¹*Med. Ibera*, 1919, num. extra. 1st Cong. de Med. y Cir. 93; ²*Jour. Amer. Med. Assoc.* 1919, Oct. 18, 1193; ³*Arch. of Ophthalmol.* 1910, 435; ⁴*Bull. Nela Research Lab.* 1919, i, Paper 61; ⁵*Ann. d'Oculist.* 1919, xlv, 338; ⁶*Med. Ibera*, 1919; ⁷*Ibid.*; ⁸*Minnesota Med.* 1919, ii, 461; ⁹*Brit. Jour. Ophthalmol.* 1920, May; ¹⁰*Ibid.* Feb.; ¹¹*Ibid.* 1919, Nov.

CAUSALGIA.

J. Ramsay Hunt, M.D.

Leriche,¹ who made many important contributions to the question of the peripheral sympathetic system during the war, reviews his experience with the causalgias, and peri-arterial sympathectomy, which he suggested for its relief. This condition was first described by Weir Mitchell during the American Civil War, and is characterized by an atrocious burning, scalding pain, a concomitant of nerve injury.

ONSET.—Usually causalgia develops several days after the injury to the nerve, and increases in intensity over a period of weeks. Leriche, however, has observed in a number of cases its development immediately after injury. This is one reason for believing that causalgia is a primary phenomenon and the immediate consequence of certain wounds, and not the result of vicious cicatrization and irritative neuritis. These secondary changes may, however, produce causalgia by involving the peri-arterial ramifications of the sympathetic.

SYMPTOMS.—There are certain symptoms especially worthy of comment. Patients with causalgia present a certain curious mental state. They are anxious, fearful, and crave isolation. The slightest movement or sound, or sometimes a current of air, seems to aggravate the pain. The condition suggests that of hysteria. Leriche regards this rather as an indication of a reaction of the sympathetic. Another peculiar symptom is the glossy skin. This is a secondary manifestation, and follows in the wake of the burning pain. It is therefore a trophic rather than a vasomotor phenomenon, and is associated with a general thinning or atrophy of the fingers. Ulcerations are not

common; on the other hand, disorders of growth of the hair and nails and hyperidrosis are frequent accompaniments. In all cases there is an evident relationship to the sympathetic. Another peculiarity is the attempt to ameliorate the pain by the application of moist dressings so that the skin never becomes dry. All of these peculiarities of the causalgic patient were noted by Weir Mitchell in his observations made in 1864.

Pathological Nature of the Lesions.—Four groups may be recognized:—

1. Cases in which no vascular or neural lesions are demonstrable. The wound is a simple muscular perforation, but occurring in the middle portion of the arm, or posterior surface of the thigh, and associated with intramuscular hæmorrhages.

2. Simple lesions, quite superficial, of the walls of the arteries or veins. Such an injury is in reality a perivascular wound or injury of the peri-arterial sympathetic.

3. Severe wounds of the arteries or veins, with obliteration of the lumen and conversion into a fibrous cord containing the peri-arterial sympathetic.

4. Association of causalgia with lesions of the nerve-trunks. Here the symptoms are probably referable to involvement of the sympathetic fibres of the arteries which pass to the nerve-trunks, e.g., the sciatic and median.

NATURE OF CAUSALGIA.—Leriche believes that causalgia is due to involvement of the sympathetic nervous system. It is a *syndrome* of vasomotor origin. The zones of election for the production of this disorder are in the upper extremity (anterior border of the axilla, inferior half of the anterior surface of the arm, anterior surface of the elbow, superior portion of the forearm), in the thigh (lesion of the posterior surface), and in the popliteal space.

TREATMENT.—Leriche recommends *Peri-arterial Sympathectomy*, humeral or femoral, for the relief of the condition. Many of the failures he attributes to operating too low, and in many cases of wounds of the upper arm and elbow he recommends peri-arterial denudation in the axilla. Care should be exercised always to carry the denudation above the lesion; and in cases of obliteration of the blood-vessel the procedure should always include the resection of the occluded and sclerosed blood-vessel. The results of operation in causalgia of the lower extremities are not so favourable. Nevertheless, he has had favourable results in denudation of the iliac artery.

Lewis and Gatewood² report their results in the treatment of causalgia with *Intraneural Injection of 60 per cent Alcohol*. It is difficult to determine the frequency of the condition, for statistics concerning peripheral nerve lesions differ widely. Variation is probably due to differences of opinion regarding the type of case that should be regarded as causalgia. Varying degrees of pain are observed after peripheral nerve injuries, but only the intense paroxysmal type should be regarded as causalgia. Four cases of causalgia were noted among the 550 cases of peripheral nerve injuries which were observed at U.S. General Hospital No. 28. Three of these patients have been operated on and cured by intraneural injections of 60 per cent alcohol. It is probable that the fourth patient, who is still under observation, will require this treatment. The three patients experienced almost immediate relief from pain. The ulcers and chapped bleeding areas healed rapidly, and the paralysis resulting from the injection was temporary.

Weir Mitchell believed the pain due to an ascending neuritis which might arise in any injured nerve and gradually involve all the nerves of the extremity affected. It seems to have been demonstrated, however, as a result of surgical interference, that the median nerve is involved most frequently in causalgia affecting the upper extremity, and the internal popliteal in causalgia involving the lower extremity. When a lesion of the ulnar nerve is accompanied by

intense pain, it is usually due to an associated lesion of the median nerve or to an injury of the brachial plexus affecting both ulnar and median nerves. Other nerves may be involved. In one of the cases observed by these authors, pain persisted, although diminished in intensity, over the distribution of the long saphenous nerve after injection of the internal popliteal. The pain subsided completely after injection of the long saphenous nerve.

The pathology differs widely in different cases. Joyce has reported five cases, in one of which the median nerve when freed from scar tissue appeared swollen and bluish-grey, mottled with purple spots. A small neuroma, which was adherent to the biceps, was found on the nerve. In another patient who complained of severe pain in the foot when walking, sitting, or lying down, but who had no paralysis or anæsthesia, there was found, on röntgenographic examination, a small foreign body in the neighbourhood of the sciatic nerve. When the operation was performed, the foreign body was found embedded in scar tissue just posterior to the nerve. Immediate and permanent relief of pain followed removal of the foreign body. Gosset found the median nerve only slightly affected in the operations performed by him to relieve causalgia affecting the hand. In one of the cases observed by the writers, the median and ulnar nerves were embedded in scar tissue, and the median nerve was definitely enlarged and indurated just above the antecubital fossa; in another, the internal popliteal nerve was surrounded by some adhesions which were not at all dense, and the long saphenous nerve, which was subsequently injected below the wound, appeared normal. In both of these cases neurolysis had been previously performed, but had given no relief. In the third case the median nerve appeared injected and somewhat enlarged, but its consistency did not differ from that of a normal nerve.

Sixty per cent alcohol seems in some cases to interrupt the conduction of sensory impulses, but not to interfere with the transmission of motor impulses. Motor palsies, when they do develop, are transitory and rapidly recovered from.

When this injection is made, the nerves affected should be exposed under general anæsthesia. The injection should be made above the wound or site of the injury, for in those cases in which the injection has been made below the results have been temporary. From 1 to 2 c.c. of 60 per cent alcohol should be injected. As it is injected, the nerve swells and becomes white, resembling in colour one that has been fixed in alcohol for histological study. Leriche has advocated peri-arterial sympathectomy in the treatment of these cases. The procedure of intraneural injection of 60 per cent alcohol, originally suggested by Sicard, is so simple, and the results are so satisfactory, that it should be the operation of choice. Whenever neurolysis is performed in cases of causalgia it should be combined with an intraneural injection of 60 per cent alcohol. Neurolysis alone does not control the pain in many cases, and in those in which there is some relief it is but temporary.

REFERENCES.—¹*Lyon chir.* 1919, Sept.-Oct., 531; ²*Jour. Amer. Med. Assoc.* 1920, Jan. 3, 1.

CEREBELLAR SYMPTOMATOLOGY AND LOCALIZATION.

J. Ramsay Hunt, M.D.

André-Thomas,¹ the French investigator of cerebellar function, gives a review of our knowledge of the symptomatology of this organ. He states that both physiology and clinical experience favour the conception that the cerebellar cortex may be resolved into centres of *direction*, controlling movements of extension, flexion, abduction, and adduction. The great variation in cerebellar symptomatology is, he believes, largely explained by compensation on the part of the cerebrum.

REFERENCE.—¹*L'Encéphale*, 1920, Feb., 114.

CEREBRAL ABSCESS. (*See CRANIAL SURGERY ; EAR DISEASE, INTRACRANIAL COMPLICATIONS OF.*)

CEREBRAL HÆMORRHAGE IN THE NEW-BORN.

Frederick Langmead, M.D., F.R.C.P.

The spastic paralyses of early life are due to many causes whose relative frequency it is difficult to compute. Fatal cases within the first week or so of birth are often found to be due to cerebral hæmorrhage, but it is unsound to generalize from this observation, since many of those children who survive may do so because their paralysis is otherwise explained.

F. C. Rodda¹ puts on record that the statistics of post-mortem examinations at the New-born Clinic, University of Minnesota, show that cerebral hæmorrhage is present in 50 per cent of all infants who die intra-partum or during the first few days of life. It is noteworthy that labour in these cases had often been easy and unassisted by instruments, but the hæmorrhage occurred more frequently in breech presentations and in premature births. Asphyxia was not always present. These observations led him to investigate the coagulation-time of the blood in new-born children, and he found that there is a prolongation of coagulation- and bleeding-times from the first to the maximum on the fifth day of life, with a return to the average before the tenth day. Evidences of hæmorrhages appeared when a prolonged bleeding-time accompanied a delayed coagulation-time.

His conclusion is that though severe trauma results in massive cerebral hæmorrhage and early death, a more frequent cause is mild trauma plus hæmorrhagic disease of the new-born, and is accompanied by delayed coagulation and prolonged bleeding-time. These alterations in the blood can be controlled by subcutaneous injection of whole blood. Surgery is required in severe cases, and should be employed early. The author recommends that the coagulation-time and bleeding-time should be determined in every new-born infant presenting unusual symptoms, or even as a usual routine, and that, if the reactions are found to be delayed, blood should be administered.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1920, Aug. 14, 452.

CEREBRAL SURGERY. (*See CRANIAL SURGERY.*)

CEREBRAL TUMOURS.

J. Ramsay Hunt, M.D.

Localization by Ventriculography.—It seems incredible that a brain tumour as large as one's fist can exist in either cerebral hemisphere and still escape localization by expert neurologists and neurological surgeons. Yet nearly all cerebral tumours eventually attain this size, and a very high percentage of them can neither be accurately localized before operation nor be found by an exploration of the brain.

W. E. Dandy¹ has devised a new method—*ventriculography* or *pneumo-ventriculography*—by which it is hoped that intracranial localization will be greatly assisted. He ventures the prediction that by an intelligent use of this method in the hands of competent neurological surgeons but few cerebral tumours will escape localization (*Plates XI, XII, XIII*).

Procedure.—Each lateral ventricle occupies a large area in the interior of either cerebral hemisphere. It is evident that a tumour of any size situated in either cerebral hemisphere will modify the shape, size, and position of the corresponding lateral ventricle. Quite frequently the lateral ventricle in the opposite hemisphere will be dislocated, and its size also will be greatly modified. These changes in the ventricles, both homolateral and contralateral, yield many opportunities for locating brain tumours by ventriculography.

Fortunately, following the injection of air into one lateral ventricle, it is possible to obtain a röntgenogram of each lateral ventricle separately, and thus determine alterations produced by a tumour in either cerebral hemisphere. Owing to the angles of the ventricular system, it is possible to fill only one lateral ventricle with air when the head is in a given position. After a röntgenogram has been taken, the head must be carefully turned in such a manner that the air can pass the various ventricular angles, the interventricular foramina (of Monro), and the third ventricle, and thus reach the opposite lateral ventricle. After a lateral view of each ventricle has been photographed, the head should again be carefully turned in order to direct the air into the anterior horns of both lateral ventricles; the occiput will then be on the plate, and the röntgenogram will give the size, shape, and position of the anterior part of both lateral ventricles. Then, by placing the forehead on the plate, the size and position of the body, and of the posterior and descending horns, can be demonstrated. It would seem that most tumours must give some manifestations of their presence in one of these views, and the findings must therefore indicate absolutely the position of the tumour.

To introduce air into the ventricles of an adult, it is of course necessary to make an opening in the skull. This can be done either under local or general anaesthesia, the choice largely depending upon the patient. Personally, the writer prefers local anaesthesia; the procedure need be but slightly painful, and after transferring the patient to the x-ray room his co-operation eliminates respiratory movements and allows a much better exposure.

A ventriculogram will at once tell in many cases whether the tumour is cerebral or cerebellar. In the latter cases an internal hydrocephalus will be evident by the symmetrically-enlarged lateral ventricles.

In some cases it will be found that the size of the ventricle has been so reduced that it is impossible to withdraw sufficient fluid to make the injection of air a safe procedure. It is then best to make a ventricular puncture on the opposite side and inject air into this ventricle, though occasionally both ventricles are too small. In a general way a very small ventricle is presumptive, though of course not absolute, evidence of a cerebral as against a cerebellar tumour or a tumour of the brain-stem; when there is a difference in the size of the two lateral ventricles, the tumour is usually on the side of the smallest ventricle. In infants and very young children, a puncture can be made through an open fontanelle or through sutures which have been separated by the abnormal pressure.

The writer has used ventriculography in more than seventy-five cases from Prof. Halsted's clinic at the Johns Hopkins Hospital. He concludes that ventriculography is invaluable in the localization of obscure brain tumours. So-called unlocalizable tumours comprise at present over half the total number. Practically all brain tumours either directly or indirectly affect some part of the ventricular system. Hydrocephalus is easily demonstrable by ventriculography, and, when present, usually though not always restricts the location of the tumour to the posterior cranial fossa—that is, the brain-stem or the cerebellum. Local changes in the size, shape, and position of one or both ventricles, as shown by the ventriculogram, will accurately localize most obscure tumours of either cerebral hemisphere. Every effort should be made to localize the tumours before resorting to any operative procedure. The usual subtemporal decompression is useless and dangerous when a hydrocephalus is present—that is, when the tumour is in the brain-stem or the cerebellum. A suboccipital decompression (cerebellar operation) is extremely dangerous when the lesion is in the cerebral hemispheres. To differentiate between cerebral and cerebellar lesions is frequently one of the most difficult

PLATE XI.

LOCALIZATION OF CEREBRAL TUMOURS BY VENTRICULOGRAPHY

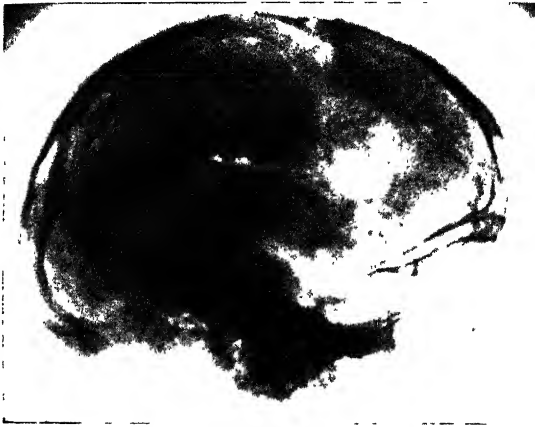


Fig. A.—Ventriculogram of a normal ventricle, lateral view.

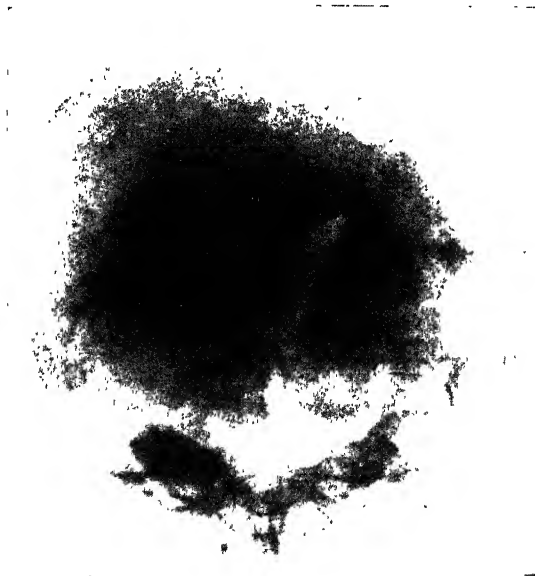


Fig. B.—Ventriculogram showing cross-section of both lateral ventricles, normal.

By kind permission of "Surgery, Gynecology, and Obstetrics"

PLATE XII.

LOCALIZATION OF CEREBRAL TUMOURS BY VENTRICULOGRAPHY

(continued)

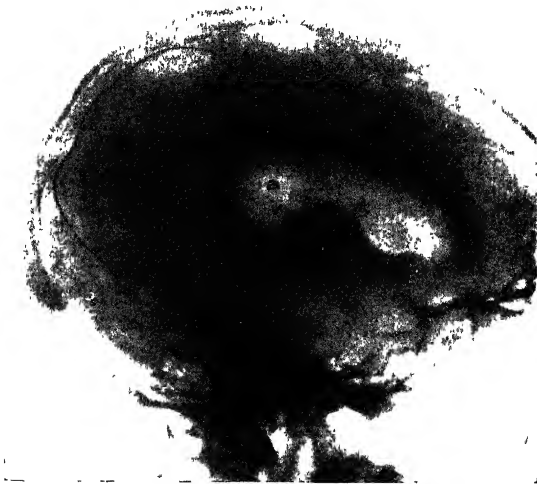


Fig. C.—Ventriculogram of left lateral ventricle. It will be seen that the posterior and descending horns of this ventricle are absent, and that the body of the ventricle ends posteriorly in a very sharp convex line. The tumour has occluded the ventricle, and fills the space posterior to the ventricular shadow (see dotted line). The sharp line of demarcation indicates an encapsulated and therefore removable tumour. (a) Posterior part of the body of the ventricle.

PLATE XIII.

LOCALIZATION OF CEREBRAL TUMOURS BY VENTRICULOGRAPHY (continued)



Fig. D.—Ventriculogram of right lateral ventricle of a patient with an unlocalizable tumour of the brain. Only the descending and posterior horns (*a*) of this ventricle are filled with air. The contour of the remainder has been projected in a dotted line (*n*) to contrast with the opposite side. There is no occlusion in the ventricle, because the air passed freely to the opposite side.



Fig. E.—Ventriculogram showing tremendous cyst-like dilation of one lateral ventricle. The patient was operated upon for focal epilepsy.

tasks in intracranial localization. Ventriculography at once separates these two groups and indicates the operation of choice.

The only cure for brain tumour is extirpation. The results in terms of complete cures of brain tumours will be in proportion to the early localizations which are made. A decompression is a purely palliative procedure, and should be adopted only when the tumour cannot be located. Ventriculography permits of an early and accurate localization of the growth when all other methods fail.

It is possible to get a separate profile ventriculogram of the whole of each lateral ventricle. Any change in size or contour is easily demonstrated. Antero-posterior views will show the same points in cross-section, but they are chiefly useful in showing any lateral dislocation of the ventricles.

Radium and Roentgen Rays in Treatment.—Williamson, Brown, and Butler² have studied the *effects of radium on normal brain tissue*. Radium is now recognized as an effective agent in the treatment of certain neoplasms. It is peculiarly adapted to application in cavities where it can be brought into direct contact with tissues. It is now also being extensively employed to advantage by implantation in neoplasms. Very frequently brain tumours are exposed by operative procedure and excision of the growths is found impossible or inadvisable, and in such instances the implantation of radium is very desirable. This has frequently been done, but without information as to the dosage that may safely be employed without unnecessarily injuring the normal brain structure. Experience teaches us the probable dosage necessary to destroy the tumour, but we have frequently not known whether such dosage could be employed with safety. The range of safety to surrounding tissue is even more important in connection with the brain than in the case of the structures that may be injured irreparably in the treatment of uterine carcinoma.

With the idea of determining, as accurately as possible, the safe dosage, the radius of activity, and the degree of reaction produced by a given amount of radium upon normal brain tissue in a known period of time, this work was undertaken. Because dogs are the most available animals, they were used. All the operations were performed under complete ether anaesthesia, and every effort was exerted to minimize shock. The radium was placed over the motor cortex, so that it might be possible to observe any functional disturbances as well as the structural lesions. In these experiments 50 mgrms. of radium were placed directly upon the brain cortex, and were permitted to remain there for 4, 6, 12, and 18 hours.

The application of radium to the brain of the dog under certain limitations as to time and strength has a destructive action, but produces no clinical symptoms. The radium, in these experiments, was enclosed in a platinum tube of approximately 0.4 mm. thickness, which removed the α and practically all the β rays, but permitted the passage of the γ rays. The writers conclude that the γ rays, after passing through 0.4 mm. of platinum, penetrate brain tissue and have a destructive action within a radius of 5 mm., with a dosage of 900 mgrm.-hours. The effect upon the blood-vessels varies according to the distance from the radium and the number of hours applied.

The above experiments give assurance that, in the case of those brain tumours which respond readily to radium, little or no damage will be inflicted upon the brain tissue surrounding the tumour if the radium is implanted in the growth. The dosage employed on the growth can be regulated so as to be destructive only to the periphery.

C. H. Frazier³ discusses *the effects of radium emanations upon brain tumours*. Because the rate of growth of brain tumours is surprisingly slow, because they

are often inaccessible or unlocalizable, because they do not metastasize but continue until the end confined to the original focus, because they are often not directly but only indirectly responsible for the subject's death, and because technical difficulties interfere with their radical removal, there is a field for some physical agency which will not only arrest the growth of the malignant lesion but even lead to a process of retrogression. Radium has been applied in the writer's clinic under the direction of Dr. Pancoast in the treatment of brain tumours in 24 cases, and from these he has selected three as illustrations of what radium may accomplish. In these there seems to be indisputable evidence that by radium emanations the growth of the tumour has been arrested and in all probability the tumour destroyed. The cases are given in abstract, and are presented in the hope that others may be encouraged to continue this clinical investigation. The subject is still in the developmental stage, and there is much still to be learned in technique. At the present time direct implantation is advocated in the growth when feasible, rather than more indirect or distant application. The matter of dosage as expressed in milligrammes or hours is in the empirical stage.

In closing, the author says that in the 24 cases of brain tumour referred to, he has not yet seen a single one known to be a glioma where the radium has had any appreciable effect. Endothelioma is unquestionably more susceptible, and hence offers the more favourable prognosis.

Röntgen-ray Treatment of Pituitary Tumours.—Steiger⁴ adds another to the 20 cases he has compiled from the literature in which the pituitary was systematically exposed to the Röntgen rays, all with satisfactory or brilliant success. The Röntgen rays were applied in cross-fire from seven fields, for fifteen minutes each, from the brow, temples, and anterior fontanelle, and by the second sitting vision was materially improved. Fourteen exposures were made in the course of four months, and vision constantly improved in the left eye, and the right was able to recognize objects. A year later the acromegaly had almost completely subsided, but menstruation had not returned.

Quick⁵ advises the application of radium in tumours of the *hypophysis cerebri*; he reports three cases with favourable results.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1920, April, 329; ²*Ibid.* Sept., 239; ³*Ibid.* 236; ⁴*Schweiz. med. Woch.* 1920, June 24, 50, No. 26 (abstr. in *Jour. Amer. Med. Assoc.* 1920, Aug. 14, 510); ⁵*Arch. of Ophthalmol.* 1920, xlix, 131.

CEREBROSPINAL FEVER.

J. D. Rolleston, M.D.

ETIOLOGY.—O. Thomsen and F. Wulff¹ calculate from their investigations and those of Fildes and Baker that 2 to 10 per cent of the civilian population are meningococcus carriers; and as these figures are only the expression of a single examination, they probably represent only half the total number of carriers. As a carrier harbours meningococci only three to four weeks as a rule, and as only about a third of those exposed to infection become carriers, it may be concluded that in large towns the overwhelming majority of the inhabitants are exposed to infection within the course of a year. Among civilians the virulence of the cocci is kept low, as in cultivation from one artificial medium to another, whereas among soldiers in confined quarters the rapid rise of virulence is analogous to that effected by passage through susceptible animals. Thomsen and Wulff found that the meningococci responsible for petechial cases—which are abnormally virulent, as shown by the high mortality and large proportion of adult cases—persist in the nasopharynx of convalescents with extraordinary pertinacity. In the ordinary non-petechial cases the meningococci rapidly disappear from the nasopharynx, and are absent in 80 to 90 per cent after the seventh day of disease; but in

22 convalescents from petechial meningitis, 13, or 59 per cent, harboured meningococci a week after their illness. In many cases of petechial meningitis the cocci persisted for months, and were refractory to various measures.

D. Embleton and W. Sohler Bryant² investigated the 'sites of carrying' in 40 chronic carriers, of whom 21 had suffered from cerebrospinal fever, and 19 were carriers only. They found that these sites were Luschka's tonsil, the fossæ of Rosenmüller, the retronasopharyngeal wall, and the faucial tonsils. The anterior and upper parts of the nose and nasal sinuses were not as a rule infected. The most powerful factor in eliminating the meningococcus in the chronic carrier was the incidence of 'a cold in the head'. The chronic meningococcus carrier, however, seemed to be relatively immune to colds, and it was only occasionally that an infectious cold spread to more than one or two individuals. The other method by which a chronic carrier became free from infection was the invasion of the 'site of carrying' by some other bacterium.

Of 905 meningococcus carriers investigated by D. Embleton and G. H. Steven,³ 86 were carriers after an attack of cerebrospinal fever (case carriers), and 819 had never suffered from the disease. The writers distinguished two groups of carriers: (1) Acute or temporary carriers, who remain infectious on an average for twenty-four days; and (2) Chronic carriers, who remain infectious on an average for five and a half months. Eighty per cent of the carriers were acute or temporary, and 20 per cent chronic. The type of coccus rarely changed, a change being observed only once in 905 carriers. Treatment of the carrier appeared to prolong the carrying period, and the best method of freeing the carrier from infection was nature, open air, and exercise.

SYMPTOMS.—According to Sir John Rose Bradford,⁴ one of the most frequent of the *anomalous types of onset* is that in which dyspnœa is the leading symptom and the other symptoms are comparatively slight. The dyspnœa is apt to be accompanied by some restlessness and probably some mental dullness and confusion. Such cases are liable to be mistaken for uræmia, but the diagnosis is readily made by complete examination of the patient, and lumbar puncture. Cerebrospinal fever may also be mistaken for nephritis, as sometimes nephritis is not only a complication but may be the only manifestation of the disease. The initial symptoms may take the form of nephritis, the meningeal symptoms being at first absent, and only developing after a week, ten days, or possibly longer.

W. W. Herrick and G. M. Parkhurst⁵ found that *arthritis* was unusually prevalent during an outbreak of 321 cases of meningococcal infection at Camp Jackson from November, 1917, to April, 1919. They describe three types, each of which possessed peculiar significance in diagnosis, prognosis, and treatment. The first, of which there were 12 examples, was an acute polyarthritis resembling acute rheumatism, frequently occurring as the initial symptom, and rarely later than the third day of disease. The type was usually associated with severe infection. Symmetrical joints were as a rule involved. There was little or no effusion. Other complications of meningococcal infection, such as panophthalmitis, epididymitis, and pericarditis, were very frequent. The duration of this type was from one to six days. The onset of the second type, of which there were 16 examples, was late, usually about the fifth day. Unlike the first type, only one joint was affected, usually the knee, and effusion was a prominent feature. The duration of the process was usually from one to four weeks, recovery being gradual but complete. The third type was the ordinary serum arthritis, which occurred in 12 cases, 6 of which had been treated by intravenous and 6 by intrathecal injections.

In necropsies on 84 cases of cerebrospinal fever, D. Embleton⁶ found *empyema of the sphenoidal sinus* in 32; on the other hand, 47 completely recovered cases examined by rhinological experts showed no signs of this complication. Operation on the sphenoidal empyema always produced an increase in general symptoms which, during the acute stage of the disease, appeared to accelerate a fatal termination. In hydrocephalus cases recovery occurred in three instances. Embleton considers it probable that the meningococci pass by the lymphatics from the sphenoidal sinus direct to the meninges. He also admits the possibility of their being conveyed to the meninges by the blood-stream.

According to Sabrazès,⁷ one of the rarest extrameningeal complications of meningococcal infection is *pyelitis*, in the pus from which the meningococcus is found in great abundance. The pyuria is accompanied by a large amount of albumin and epithelial casts. The stage of pyuria does not last long, the pus and meningococci disappearing from the urine in about four weeks. The nephritis, on the other hand, lasts for months, giving rise to a nitrogenous retention which may persist for about a year after the onset; the amount of albumin at the end of this time is very slight, but the presence of red cells and hyaline casts still indicates a certain degree of renal involvement.

De Massary and Tockmann⁸ state that *glycosuria* is a rare complication of cerebrospinal fever. They report three cases, all fatal, which occurred among 45 cerebrospinal fever patients, the lesions found post mortem being predominant in the cerebral ventricles. They therefore regard the presence of glycosuria as a symptom of inflammation of the ventricles, for which trephining and ventricular puncture should be performed.

P. N. Randall⁹ records a fatal *relapse* which occurred ten weeks after the primary attack in a man 33 years old. In both attacks the meningococcus was isolated from the cerebrospinal fluid, and the treatment consisted in lumbar puncture and the administration of antimeningococcal serum.

TREATMENT.—T. G. M. Hine¹⁰ summarizes the results of the Serum treatment of 267 military cases of cerebrospinal fever. Excluding 18 patients who died of some other disease—e.g., influenza—and septic pneumonia following cerebrospinal fever, 249 cases bacteriologically diagnosed cerebrospinal meningitis were left, among whom the mortality was 31·72 per cent. Excluding 48 in whom the type of coccus was never clearly defined, the mortality among 201 cases was 28·36 per cent (57 deaths). Among 141 cases in which treatment was begun before the sixth day, the mortality was 19·14 per cent; whereas among 60 cases in which the serum was given after the sixth day, the mortality was 50 per cent. The classification and mortality of the 201 cases was as follows:—

65	were	Type I	with a mortality of	9·23	percent
104	"	" II	"	39·42	"
28	"	" III	"	25·00	"
4	"	" IV	"	75·00	"

Besides the four type serums, a pooled I and II serum was used which was given at the start to avoid waste of time while the tests were being made.

H. M. Mackay¹¹ reports 8 cases of cerebrospinal fever in children under eight years of age treated by repeated **Lumbar Puncture**, which was employed ten to twenty-five times, and intrathecal injection of **Polyvalent Antimeningococcal Serum**, without a single death, although some of them were very severe chronic cases of the posterior basic type: 5 made a complete recovery, apart from deafness in one case and strabismus in another; and 3, in one of whom twenty-one ventricular punctures were performed, became mentally defective.

According to R. L. Haden,¹² who records a case cured by **Intravenous Therapy** alone, prolonged intraspinal treatment is very apt to result in permanent ill-effects from involvement of the cauda equina and nerve-roots. Intravenous treatment, on the other hand, renders fewer intrathecal injections necessary, and thus reduces their harmful effects to a minimum.

K. Lewkowicz,¹³ who reports a series of 22 cases, 10 of which were in children and 12 in adults, regards the lateral ventricles as the principal site of infection in cerebrospinal meningitis, and therefore gives **Intraventricular Injections** of antimeningococcal serum in doses of 10 to 20 c.c. into both ventricles every three days. He recommends that the serum should not be given beyond the second week dating from the first injection. **Vaccine** treatment should also be employed from the first in addition to serum. Malvani¹⁴ also recommends vaccine treatment to supplement serotherapy. He found that its value was greatest in severe cases that showed no tendency to recovery with serum alone, whereas by vaccine treatment the infection was so attenuated that the natural defensive forces were enabled to gain the upper hand.

REFERENCES.—¹*Med. Science*, 1920, ii, 85; ²*Lancet*, 1919, ii, 679; ³*Ibid.* 682; ⁴*Ibid.* 1920, ii, 535; ⁵*Amer. Jour. Med. Sci.* 1919, ii, 473; ⁶*Lancet*, 1920, i, 7; ⁷*Med. Science*, 1919, 137; ⁸*Ibid.*; ⁹*Practitioner*, 1920, i, 152; ¹⁰*Brit. Med. Jour.* 1920, ii, 426; ¹¹*Lancet*, 1920, i, 238; ¹²*Arch. of Internal Med.* 1919, ii, 514; ¹³*Arch. de Méd. des Enf.* 1919, 618; ¹⁴*Jour. Amer. Med. Assoc.* 1920, i, 1612.

CEREBROSPINAL FLUID.

O. C. Gruner, M.D.

Bigland¹ discusses the routine examination of the cerebrospinal fluid for the detection of nervous disease. This comprises:—

1. *Cell-count*.—Whereas Bigland recommends the use of a Zeiss leucocyte-counting pipette, Greenfield² prefers to dilute the specimen in a test-tube ($\frac{1}{4}$ by $\frac{1}{2}$ in.) without using these pipettes. This is because the ordinary blood-counting pipette is not easily cleared of every cell (thus introducing errors), and because it is inconvenient to have a number of pipettes where many specimens must be studied. He adds so much stain to so much fluid. Bigland counts in a Fuchs-Rosenthal chamber. The number of cells in all 256 squares divided by 3 gives the number per c.mm. The usual number of lymphocytes is not more than 1 per 256 squares. Greenfield points out that neutrophils enable a diagnosis to be made between cerebral abscess and tumour, and between lethargic encephalitis and polio-encephalitis. Clumps of cells like large mononuclears mean tumour; discrete large mononuclears in abundance mean general paralysis.

2. *Protein Content*.—Equal volumes of cerebrospinal fluid and saturated solution of ammonium sulphate are mixed. In the Ross-Jones test the second is added to the first as a ring test; in the Nonne-Apelt test they are mixed. The former method gives albumin as well; the latter only shows globulin. Bigland also uses the Pandy test (add 10 per cent carbolic acid: a white cloud means protein), and the test in which equal volumes of spinal fluid and 10 per cent sulphosalicylic acid are mixed together (a cloud occurring in more than 1-10 dilution is a sign of disease). Greenfield recommends estimating the albumin by Mestrezat's method. The object is to be able to say precisely if the globulin fraction is the dominant part of the total protein. In that case the diagnosis of syphilis may be considered.

Ravaut and Boyer³ have devised a method of estimating the albumin, by comparing the fluid to be tested (after precipitation with sulphosalicylic acid) with an opalescent solution of silver nitrate. Two similar tubes are used. Add about 1 c.c. spinal fluid to A (*Fig. 10*), and a like quantity of 0.025 per cent silver nitrate to B. Add a $\frac{1}{2}$ vol. of test solution (crystallized salicylic acid 13 grm., pure H_2SO_4 15 c.c., mix carefully; when it crystallizes, warm

gently till fused; cool; dissolve in water up to 100 c.c., and filter) to A, and add a like amount of 5 per cent solution of NaCl to B. If the two opacities are equal, there is 1-grm. per litre of albumin. If A is less opaque than B, add more saline (5 per cent) drop by drop until the opacities are equal. Graduations enable the albumin equivalent to be read. If A is more opaque than B, $1\frac{1}{2}$ vols. of distilled water are added to A. If the opacity is still greater, another $1\frac{1}{2}$ vols. are added, and so on. Each addition means another gramme per cent of albumin. Blood does not interfere with this part of the examination unless plentiful.

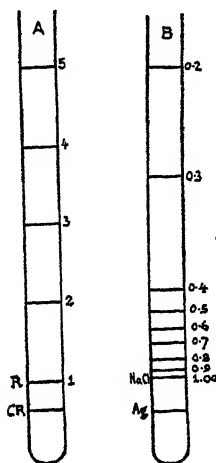


Fig. 10.—Ravaud and Boyer's albuminometer for cerebro-spinal fluid.

CR = level of spinal fluid.
R = " reagent.
Ag = " silver nitrate sol.
NaCl = " 5 per cent saline.

3. *Wassermann Reaction*.—Greenfield heats the fluid to be tested. Bigland employs unheated fluid. He uses five strengths, ranging from 1 c.c. to 0.5 c.c. Schönfeld⁴ finds a uniformly negative result in 127 normal persons.

4. *Lange's Colloidal Gold Test*.—Bigland places this second to the Wassermann in value. The test was described in the MEDICAL ANNUAL of 1915, p. 193. Making ten dilutions of spinal fluid, varying from 1-10 to 1-5120, the colours which appear are read off as numbers: 0 = red, 1 = red-blue, 2 = violet, 3 = blue, 4 = bluish-white, 5 = colourless. In general paresis a typical reading is 5555554210; in tabes, it is 2221110000; in cerebrospinal syphilis it is like 12233320000. Greenfield finds curves like the first ('paretic curves') in disseminated sclerosis, subacute combined degeneration, paraplegia from Pott's disease, and in several cases of tabes. He finds 'luetic curves' (i.e., like the second and third examples) in epilepsy also. Cruickshank⁵ locates the substance giving this reaction in the globulin fraction. The globulin precipitates, the albumin inhibits or protects. He does not attach much importance to reactions in meningitis.

Mras and Brandt⁶ have obtained positive reactions in post-mortem cerebrospinal fluid regardless of syphilis. The intensity of reaction increases with the time that has elapsed since death.

These constitute the standard tests which Solomon⁷ advocated, but there are some other tests which present interest:—

5. *Other Tests*.—*Colour*: A yellow spinal fluid has been noted by Nammack⁸ as occurring in a number of diseases of cord and meninges. In acute and subacute conditions it strongly suggests the probable diagnosis of tuberculous meningitis or poliomyelitis.

Morse and Crump⁹ discuss the *performed ammonia* in the spinal fluid, and give a simple method for determining it (based on the use of Nessler's reagent). An increase means acidosis or uræmia.

Levinson¹⁰ has referred to *increase in the pressure* with which the fluid leaves, as a sign of 'meningism', but Bigland does not attach much importance to this.

Herrick and Dannenberg¹¹ consider the state of the spinal fluid in diseases other than those of the nervous system. Changes such as are found in meningitis have been met with in cases of pneumonia, scarlet fever, gastro-enteritis, diphtheria, tetanus, malaria, etc. The authors refer to such a condition as

'meningismus', and attribute it to an active invasion of the 'meningeal-choroidal complex' by the particular organism. The most important conclusion to be drawn, however, is that the findings which indicate a diagnosis of one of the stereotyped meningitides are not pathognomonic, but require to be corrected by the clinical features of the case. In the discussion of Herrick and Dannenberg's paper, there are several references to the fact that our knowledge about the cerebrospinal fluid under all circumstances is so rudimentary that the whole subject of its clinical pathology needs to be reviewed.

Jacobson¹² reports on the effect of injecting cerebrospinal fluid into animals. He concludes that pituitary secretion does not enter into it.

McDonagh¹³ brings forward a new test for degenerative encephalitis. 2 c.c. of benzene or xylol are added to 2 c.c. of cerebrospinal fluid, shaken for a few minutes, centrifuged, re-shaken, and re-centrifuged. In degenerative encephalitis the upper half of the tube is occupied by hydrocarbon protein, instead of unaltered hydrocarbon. The whole paper will repay careful perusal.

REFERENCES.—¹*Lancet*, 1920, ii, 687; ²*Ibid.* 765; ³*Presse méd.* 1920, Jan. 17, 42; ⁴*Deut. Zeits. f. Nervenh.* 1919, lxiv, 300; ⁵*Brit. Jour. Exper. Pathol.* 1920, i, 71; ⁶*Wien. klin. Woch.* 1919, Oct. 16, 1021; ⁷*Arch. of Neurol. and Psychiat.* 1919, iii, Jan., 49; ⁸*Amer. Jour. Med. Sci.* 1920, April, 540; ⁹*Jour. Lab. and Clin. Med.* 1919, Dec., 185; ¹⁰*Med. Record*, 1919, June 28, 1117; ¹¹*Jour. Amer. Med. Assoc.* 1919, Nov. 1, 1322; ¹²*Johns Hop. Hosp. Bull.* 1920, June, 185; ¹³*Lancet*, 1920, ii, 991.

CERVICAL AND FIRST DORSAL RIBS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

It is interesting to note that a cervical rib is found in about 1 per cent of all bodies in anatomical departments. Great care should, however, be exercised in ascertaining that the condition is not one of rudimentary first dorsal rib. A count of the vertebræ will make this clear. Sometimes the distal end of the shaft is free, sometimes it articulates with the shaft of the normal first rib, sometimes there is a junction with the first rib at the sternal end, sometimes they have their own distinct attachments to the sternum. The condition is more common in women than in men. Frequently it is bilateral, and, if unilateral, more on the left side than the right. It is well known that the sensory and motor nervous disturbances and the vascular phenomena which call attention to the presence of the cervical rib do not appear until adult life. A palpable tumour is sometimes found in the neck. A cervical rib giving rise to these symptoms can be demonstrated either by the presence of a palpable tumour in the neck or by an x-ray photograph. It can be excised through an incision exposing the transverse processes behind, or by a curved incision $3\frac{1}{2}$ in. in length, the lower half of which is parallel to and just above the clavicle; the upper part of the incision is parallel to the trapezius. The brachial plexus is retracted forwards and backwards as far as necessary to expose the rib. The periosteum should also be removed to prevent recurrence. G. B. Davis¹ draws attention to these points.

Wheeler² describes cases of *compression neuritis due to the normal first dorsal rib*. At first sight the condition present appeared to be a form of ulnar nerve neuritis, occurring without trauma or other obvious reason. On consideration of such cases the surgeon would more likely search for the presence of a cervical rib. X-ray examination is, however, negative. Pain along the ulnar border of the arm and forearm is a fairly constant symptom, and this pain is increased by anything which depresses the shoulder girdle. There is often atrophy and paresis of the intrinsic muscles of the hands, and the flexors and extensors of the wrist may be involved. Light touching can often be appreciated better than pinpricks, a dissociation which rather denotes nerve compression.

Compression of the nerve-trunks against a normal first rib may be associated with anything which lowers the shoulder girdle—for example, a fractured clavicle. The majority of cases, however, occur in young adults without apparent cause; but it must not be forgotten that at puberty a 'normal' descent of the shoulder takes place, especially in women. If this is exaggerated and the lower brachial nerve-trunk has a particularly large contribution from the one or two dorsal nerves, compression may follow.

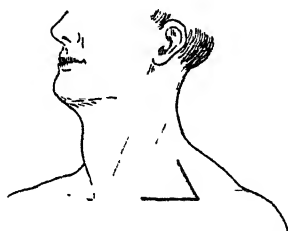


Fig. 11.—Incision for removal of the first rib working from behind.

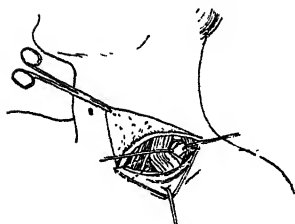


Fig. 12.—Retraction of plexus forwards towards scalenus anticus.

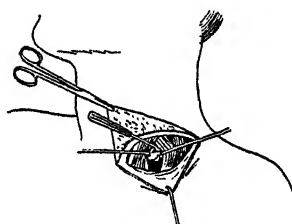


Fig. 13.—Exposure of the rib nearer the compression point: the plexus is now retracted backwards.

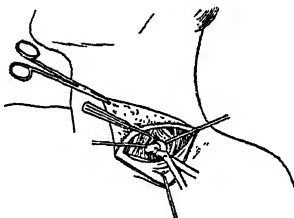


Fig. 14.—Division of rib between the retracted artery in front and the plexus behind.

J. B. Murphy states that occasionally elongation of the transverse process of the seventh cervical rib, or acute angulation of the first rib at its juncture with the transverse process, produces the same symptoms as a true seventh cervical rib. Others, however, allege that there is no such thing as a true enlargement of the transverse processes of the seventh cervical vertebra. The so-called enlargement is in every instance a rudimentary rib (G. L. McWhorter³).

A great difficulty arises in certain cases when a cervical rib is present but where the real trouble is caused by compression of the nerve against a normal first rib. *Figs. 11-14* illustrate the operation for the removal of the first rib. The rib should be divided in front of the groove which is supposed to carry the subclavian artery. As a matter of fact the artery does not as a rule lie in direct contact with the rib, but the lower trunk of the brachial plexus will be tightly stretched like a band across the inner border. It would be difficult to remove the rib with the periosteum, and in the opinion of the reviewer this is not necessary. In the first place, after removal of the segment in relation to the nerves, the ends of the divided rib fall towards the thorax, and new bone would take a curved direction away from the plexus, thus relieving compression. Secondly, the periosteum can be stripped from the rib, not in the usual way, but backwards and forwards like rolling up a sleeve, and thus make a formation of new bone improbable.

Compression of the lower cord must be suspected in any case of sensory nerve symptoms along the distribution of the cord. There are no changes in the reflexes; there is never complete anaesthesia, and some cases simulate Raynaud's disease. Diseases of the spinal cord and its coverings should always be considered. The superficial position of the artery may lead to the diagnosis of aneurysm. Cabot has said: "A pulsating mass about the clavicle means a cervical rib nine times out of ten".

REFERENCES.—¹*Surg. Clin. of Chicago*, 1920, iv, 269; ²*Practitioner*, 1920, June; ³*Surg. Gynecol. and Obst.* 1920, Aug., 89.

CHAGAS' DISEASE. (See TRYPA NOSOMIASIS.)

CHANCROID.

Colonel L. W. Harrison, D.S.O.

L. H. Jacob¹ says that failure of the usual methods of treating chancroid is due to the depth at which the organism lies. He has treated 142 cases of chancroid by the High-frequency Spark combined with Copper Sulphate application, and claims for it better results than by any other method. His attention to this form of treatment was attracted by the work of Robbins and Seabury.² Eberhart³ claims that it is a better method than acid cauterization. Jacob modified the technique of Robbins and Seabury as follows: (1) A pledget of wool soaked in 10 to 20 per cent cocaine is applied to each lesion for four or five minutes. (2) Each sore is thoroughly cleaned until it bleeds. (3) When the bleeding has ceased and only serum oozes, a specimen is taken for dark-ground examination, and a 25 per cent solution of copper sulphate is applied. The high-frequency spark from a rather fine-pointed vacuum electrode is then applied from one to three minutes, taking care to carry the point of the electrode well down into any fissure. The application is not stopped until the surface of the sore is completely changed to a dark greenish-grey colour. A moist dressing is then applied. There is no reaction, and the previously painful sore becomes painless.

Mergelsberg,⁴ having tried most methods of treating chancroid, now employs Zinc Chloride applications as recommended by E. Hoffmann⁵ for phagedæna. A few drops of water are added to some zinc chloride powder to make a thick paste, which is applied to every nook and cranny of the sores and allowed to act for two to four minutes. The healthy tissues are protected previously by the application of an inert paste, and pain, which may be smart for half an hour, is prevented by anaesthetizing the part. Afterwards the parts are bathed two or three times a day with hot Potassium Permanganate solution, as recommended by E. Hoffmann, and dressed between baths with Silver Nitrate 0.2, Balsam of Peru 2.0, Vaseline to 20.0. The author warns

against instituting the treatment until adequate microscopical examination has excluded syphilis; otherwise syphilis may be overlooked.

Reenstierna⁶ successfully treated a chancroid, which had resisted all measures for thirteen months, by injecting an **Antiserum** which had been prepared from a culture of the streptobacillus obtained after inoculating the patient's arm with secretion from the sore. Improvement commenced on the second day, and the extensive sore in the groin healed rapidly.

L. Cheinisse⁷ reviews recent methods of treating bubo. Amongst others he mentions the method of Goubeau. If the bubo has not yet broken down, 1 or 2 c.c. of a 1 per cent solution of **Arsenate of Soda** are injected into it. If pus has formed, it is evacuated by a small puncture, and 1 or 2 c.c. of the same solution, to which 0.5 c.c. ether has just previously been added, are injected. The ether evaporates and distributes the arsenate of soda throughout the sac. The injections are repeated every other day. Dubreuilh and Mallein have modified Fontana's method of puncture followed by injection of hot iodoformed vaseline, by injecting the vaseline cold. Lasserre replaces the iodoformed vaseline with the following, Mencièr's solution: iodoform, guaiacol, eucalyptus oil, and 90 per cent alcohol, of each 10 parts, balsam of Peru 30, and ether 100. After puncture and expression of the pus, a 1 c.c. Luer's syringe is filled with the preparation, which is injected. As soon as the syringe is removed the hole is plugged with gauze, and the solution is allowed to act for a minute before being expressed. A dry dressing is then applied. Hudelo and Rabut⁸ adopt the same technique, but inject Bory's preparation—iodoform 1, xylol 10, olive oil 40—until suppuration has almost ceased, when Mencièr's ointment is used.

Floquet⁹ introduces a filiform drain at the junction of the diseased with the healthy tissue, and removes it as soon as the sac has become flattened, about the fifth day. He claims that healing follows in a week. [The reader will note the modern tendency to refrain from making a large incision into buboes. The reviewer has no reason to be dissatisfied with the results of aspiration followed by injection of **Electrargol** into the sac; but when this fails to arrest suppuration, a small puncture at the extreme lower pole with the introduction of a capillary drain usually succeeds.—L. W. H.]

See also the use of **Mercurochrome**—220 (p. 15); and **Pepsin** (p. 17).

REFERENCES.—¹*Arch. of Dermatol. and Syph.* 1920, April, 434; ²*Jour. Amer. Med. Assoc.* 1917, lxi, 1217; ³*Brief Guide to Vibratory Technique*, Medical Book Co., Chicago, 1915; ⁴*Münch. med. Woch.* 1920, xxvi, 749; ⁵*Die Behandlung der Haut- und Geschlechtskrankheiten*, Bonn, 1919; ⁶*Hygiea*, Stockholm, 1920, xxx, 270 (abstr. in *Jour. Amer. Med. Assoc.* 1920, July 16); ⁷*Presse méd.* 1920, xxix, 285; ⁸*Ibid.* 1919, lxvii, 676; ⁹*Ibid.* 1920, v.

CHEST, SURGERY OF. (See THORAX, SURGERY OF.)

CHILBLAINS.

E. Graham Little, M.D., F.R.C.P.

Grunbaum¹ has been disappointed with the results of treatment with **Alpine Sun Lamps**, but is very satisfied with his experience with **Diathermy**, and claims that a cure can be effected by this agency in few sittings and in a short time.

Vaccines in (see p. 22).

REFERENCE.—¹*Wien. klin. Woch.* 1920, Jan., 16.

CHILD WELFARE. (See MATERNITY AND CHILD WELFARE.)

CHILDREN, DENTAL SEPSIS IN. (See DENTAL SEPSIS.)

CHILDREN, FEVER IN.*Frederick Langmead, M.D., F.R.C.P.*

Cases of unexplained fever in childhood fall within the experience of all medical men. Sometimes it persists for several days or weeks, every available means of diagnosis is brought to our aid, and yet the explanation of the fever remains undiscovered. D. Greenberg¹ records three such cases in which the pyrexia continued for 35, 17, and 14 days respectively. Typhoid fever, influenza, pneumonia, pneumococcal peritonitis, intestinal infection, and septicæmia were all considered, but a diagnosis of any one of them was unsupported by the clinical course. Pyelitis, a cause of fever frequently overlooked in childhood, was not present. Sinusitis, as he observes, is less easy to exclude. Infection of the tonsils and pharyngeal mucosa, otitis media, and dental sepsis no doubt explain some cases, for an examination may reveal nothing obvious in any of these, yet there is associated enlargement of glands, and proper treatment banishes the fever. Acute rheumatism quite possibly sometimes manifests itself outwardly only by pyrexia, with perhaps slight cardiac dilatation, which could easily be ascribed to the fever itself. Again, tuberculosis of intrathoracic glands is a probable cause of some of these mysterious pyrexias, for it must be remembered that post-mortem examinations often reveal its presence when physical signs have been entirely lacking. It is seldom recognized, yet it is hardly probable that during its development, up to and including the stage of softening, fever is altogether absent. This is shown by the fact that in cases which are diagnosed and followed, pyrexia is a common symptom.

H. Jumeau's² view is that many so-called obscure febrile and subfebrile conditions, for which a pathological cause is sought in vain, are in reality instances of purely physiological hyperthermia, and not fever. Many physiological causes may produce a variation of temperature in children, and of these exercise is perhaps the most important. A walk of three miles at an ordinary rate, he says, will raise the temperature of a child, sometimes as high as 100.2°. Hyperthermia may also be of alimentary origin. A nursing, during the menses of its nurse, will often develop a temperature of 100.4°. In early childhood, a quarter of an hour after eating, the temperature falls and then rises about a degree. It is also influenced by the character of the food. Nervous children are more subject to fluctuations of temperature than others. He counsels, however, against making a diagnosis of functional hyperthermia until after a careful examination and the exclusion of pathological causes, of which latent tuberculosis is the chief. [By 'latent' tuberculosis, perhaps 'undetectable' tuberculosis is intended.—F. L.]

REFERENCES.—¹*Med. Record*, 1920, May 1, 736; ²*Bull. méd. Paris*, 1920, April 10, 362 (abstr. in *Jour. Amer. Med. Assoc.* 1920, June 12, 1678).

CHILDREN, GASTRO-INTESTINAL DISORDERS IN. (*See also* INFANTILE DIARRHŒA AND VOMITING; INFANT FEEDING.)

Frederick Langmead, M.D., F.R.C.P.

Intestinal Obstruction in Infants.—G. M. Bullova and R. E. Brennan¹ record an extraordinary case of intra-uterine intestinal obstruction due to inspissated and impacted meconium. The baby was born by a normal labour, and nothing abnormal was noticed except that the abdomen was slightly distended. Twenty-four hours later it was reported that she had passed no meconium. No masses could be felt in the abdomen, but some definite resistance was encountered in the right upper quadrant. The rectum was empty. A cystoscope passed per rectum revealed a small dimple about 1 in. above the anus, through which a small amount of 'sebaceous' material oozed. Next morning the temperature had risen to 102°, the abdomen was tense and swollen,

and the knees were drawn up. Laparotomy was performed and a considerable amount of free fluid evacuated. The coils of the small intestine were injected, covered with fibrin, and much distended, and through their thin walls meconium was visible. The large intestine, 1 cm. broad, was totally collapsed, but had a perfect lumen; it contained more of the same whitish sebaceous material which had been seen per rectum. An ileostomy was hurriedly performed, and the child died five hours later. The intestinal blockage was found to be due to impaction of the white inspissated and stratified contents. There was no gross abnormality of the bowel. The authors could find no record of a similar case.

Acute Colitis.—Bravo² has reported on 50 cases in children of from 1 to 5 years old. The streptococcus was mainly responsible, and occurred either alone or in company with the colon bacillus. Other streptococcal lesions were associated with the colitis, and pyelonephritis frequently followed. In 35 per cent a febrile bronchitis immediately preceded the colitis. Two children developed the colitis while other members of the family were suffering from influenza. Only 2 of the 50 were breast-fed; the majority were eating at the family table, and the precocious use of meat, eggs, and cheese may have predisposed them to infection.

Chronic Indigestion.—Writing on the treatment of this malady, J. Lovett Morse³ emphasizes the need for excluding or treating diseases other than those of the digestive tract, and for removing or remedying all causes of fatigue, whether it be physical or mental. It is surprising how often the source of the chronic indigestion is found outside the digestive tract. Chronic disease of the tonsils or accessory sinuses is a common cause of indigestion, and unsuspected pyelitis a not infrequent one. Over-fatigue is even more important, the whole difficulty in many cases being due to over-play, over-study, over-excitement, or too late hours. Removal of these various causes will result in disappearance of the indigestion almost at once; but until they are dealt with, very little or no improvement can be expected even with the most rigid attention to details of feeding. Incidentally it is important, no matter what the cause, to regulate exactly the intervals between meals, to enforce regularity, and to forbid the taking of food between meals. Proper mastication of food should also receive attention. Treatment in the next place consists in regulating the amount of food and eliminating indigestible food. In the majority of the milder cases this is all that is necessary.

In other cases, however, particularly in the more serious, the subject is more complicated, because there is an intolerance, more or less marked, for one or perhaps two of the elements of food, an intolerance usually resulting from over-feeding with this element in the past. Coupled with the intolerance there may be fermentation of the intestinal contents due to abnormal bacterial activity. There thus emerge special varieties of indigestion, associated with intolerance for (1) fat, (2) sugar, (3) starch, (4) proteid, and with (5) fermentation. Further treatment, therefore, consists in arranging the diet to fit the digestive capacity of the particular child. The element which is ill borne must be reduced, and the caloric value adjusted by increasing the others. Then it must be increased as fast as the improving tolerance will allow. The diet must be laid out explicitly, and the number of grammes of the offending food element to be given daily must be stated definitely. The number of calories which the child needs must also be indicated. This line of treatment also deals with the bacterial factor, since modification of the diet is the only satisfactory way of varying the intestinal flora. When organisms of the gas bacillus group are the cause of the fermentation, something may be done to limit their activity by the administration of

Lactic-acid-producing Organisms. The method the author favours is by giving **Buttermilk**.

There is no place for the so-called digestants in the treatment, nor for drugs, except temporarily to relieve symptoms. Recovery in the severe cases is a matter of months and sometimes of years, while relapses are frequent. It is, however, almost always possible if the treatment is careful enough and continued for a sufficiently long time.

J. H. Kerley¹ considers *hyperchlorhydria* a common cause of defective appetite in older children, with variable desire for food, indefinite abdominal pains, flatulence, and acid eructations as resulting symptoms. Indiscretions in diet play an important part in its etiology. Its treatment consists in giving **Alkalis**, of substituting an easily digestible, non-irritating **Diet**, and giving due attention to **General Hygienic Measures**. The mother is instructed to see that the child has nothing very hot or cold, sweet or sour. Thorough mastication and avoidance of hurry over meals are important. Orange-juice, if permitted at all, must be relegated to the morning meal. Only the white of egg is permissible, as the yolk tends to excite acid secretion. Highly-seasoned soups must be interdicted, and red meat served only once a week. Excess of sugar and sweets, sodas, ice-cream, and pastry must be avoided. Tea, coffee, and ice-water are harmful. Raw fruit must be withheld until the appetite is normal. The diet recommended is one of farinaceous foods, with milk, potatoes, green vegetables, meats (except red meat), and toast.

For X-rays in tuberculous colitis, *see p. 28*.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, Dec. 20, 1882; ²*Siglo med.* 1919, Dec. 6 (abstr. in *Jour. Amer. Med. Assoc.* 1920, Feb. 7, 430); ³*Jour. Amer. Med. Assoc.* 1920, July 10, 91; ⁴*Med. Record*, 1920, May 8, 786.

CHILDREN, URINARY DISORDERS IN. *Frederick Langmead, M.D., F.R.C.P.*

Suppuration in the Urinary Passages in Children.—Pyelocystitis and suppurative nephritis are now recognized to be comparatively common in children, especially in female infants, but are still frequently overlooked owing to a lack of routine examination of the urine of infants. Lozano and Ruiz¹ give details of 25 cases, all but 5 in girls. Of these children, 10 were between two and five; 6 were less than a year old; 4 were between one and two; and 4 were between five and thirteen. The colon bacillus was found alone in 25 per cent, and associated with other germs in 33 per cent. The disease was usually secondary, following gastro-intestinal disorder in about 33 per cent, measles in 25 per cent, and infectious sore throat in about 10 per cent; it was primary in less than 15 per cent.

SYMPTOMS.—High fever was usually the first symptom to attract attention; it was remittent or irregularly intermittent, and often accompanied by chills and sweats. Cystitis alone was less often associated with fever, especially in older children. Pallor, disturbances in micturition, and sometimes pyuria, confirmed the diagnosis. As a means of determining whether the kidneys were affected, renal cells in the urine were important. The kidney, its pelvis, and the bladder were sometimes affected together. Only 3 of the cases terminated fatally, and these were of tuberculous children.

TREATMENT.—The authors recommend that during the febrile period the child should be kept in bed, and that the diet should consist only of milk with large quantities of water; if the child refuses to drink, the water may be administered as enemata or by an œsophageal tube. Their experience with alkalis, which are advocated by John Thomson and have proved valuable in many hands, was not very satisfactory. Salol should not be given if the kidneys are affected; **Epinephrin** they found very useful, especially in pyelo-

nephritis. They give 4 to 6 min. of the 1-1000 solution for each year of age, and combine it with 12 to 30 gr. of **Hexamine**, continuing the latter until the pus disappears from the urine. Should this treatment fail, they advocate **Autogenous Vaccines**. A case of pyelonephritis due to the *B. coli* which had lasted for four months, and another of pyelocystitis due to the *B. lactis aerogenes* which had lasted for fifteen months, soon cleared up under vaccine therapy. A third case treated in this way was benefited, but not cured. Local treatment to the bladder is rarely needed in their experience. Pain is relieved by **Hot Applications** and **Sitz Baths**.

PROGNOSIS.—E. Rhonheimer² has obtained information with regard to the prognosis of 122 cases of pyelonephritis in infants. Examination from one to eight years afterwards showed the urines to be normal; no recurrence during the interval was known. This complete recovery in infants is contrasted with what is observed in pyelitis in older children. In the latter, recurrence is so common that many hold that the pyelitis of pregnancy is merely a recrudescence of an infection dating from childhood. About 23 per cent of Rhonheimer's cases were of boys, and necropsy showed severe changes in the kidneys and only slight lesions in the bladder. His view is that infection in infants is blood-borne, whilst in older children it is usually ascending. After infancy, fully 90 per cent of the patients with pyelitis are females.

Purpuric Nephritis in Children.—That nephritis may complicate arthritic purpura is well known. Seven such cases which ended fatally were reported by Osler. P. Nobécourt³ records the case of a girl of 15 who developed nephritis after having presented for four months the symptoms of arthritic purpura, unaccompanied by bleeding from mucous membranes. Blood was noted in the urine on two occasions, and 0.3 to 0.5 grm. albumin per litre was passed continually. In Nobécourt's experience purpuric nephritis with hæmaturia is rarely accompanied by œdema, uræmia, or high blood-pressure, whereas purpuric nephritis without hæmaturia is apt to be more protracted, the albuminuria persisting perhaps for two to six months. The form with hæmaturia may subside in four or five weeks, or may persist indefinitely; it ended fatally in 25 per cent of the cases on which the paper was based.

Treatment is indicated both for the purpura and the nephritis. For the purpura, subcutaneous injections of **Peptone** were beneficial in some cases. **Calcium Chloride** is worthy of trial. Little advantage followed the use of tannin, ergot, or krameria for the renal hæmorrhage. The nephritis he treats mainly by Diet, giving milk alone for a short time, then milk and vegetables, with a small amount of mutton or ham. Salt need not be excluded unless there is retention, but not much should be allowed. Protracted detention in bed is recommended, as getting up may cause a relapse of the purpura and increase the albuminuria. Careful treatment cannot be expected to do more than ward off complications.

REFERENCES.—¹*Arch. Españ. de Pediatría*, 1919, July, 385 (abstr. in *Jour. Amer. Med. Assoc.* 1919, Nov. 29, 1732); ²*Cor.-Blatt. f. Schweiz. Aerzte*, 1919, Dec. 18, 1929, (abstr. in *Jour. Amer. Med. Assoc.* 1920, Feb. 14, 495); ³*Bull. méd., Paris*, 1919, Sept. 13, 503 (abstr. in *Jour. Amer. Med. Assoc.* 1919, Nov. 15, 1557).

CHOLERA.

Sir Leonard Rogers, M.D., F.R.S.

PROPHYLACTIC INOCULATION.—T. C. McCombie Young¹ reports on the results of an extensive trial of protective inoculation against cholera in coolies going to Assam from Behar and Bengal. As it was not possible to give more than one dose, nor to retain the coolies more than two or three days after injection, it was objected that it would be of little value, and the temporary negative phase after the injection might predispose to cholera on the way during the first part of the journey. Rogers' advice was asked, and he recommended

the trial of a single inoculation and retention for a few days of any showing undue reactions, which was done with highly successful results. In the two and a half months up to the middle of March, before the inoculations were begun, the deaths from cholera among the emigrants to Assam was 6·78 per mille; while in an equal subsequent period of time among the inoculated it was only 1·8 per mille, although the cholera epidemic increased steadily during the latter two and a half months in the recruiting districts, as it always does in Bengal and Behar at this time of the year. In 1908 similar conditions prevailed, and the mortality among the coolie emigrants to Assam continued throughout the cholera season unabated, the death-rate being 7·4 per mille; so that the sudden and lasting decrease in 1919, beginning one week after the inoculations were commenced, was clearly due to that measure, which allowed of a quarter of a million labour emigrants being obtained, to the great benefit of the Assam tea industry, while many lives were saved.

A. Roy² records details of prophylactic inoculation against cholera in a village near Hazariabagh in the Chota Nagpur district of India. During the previous two months 20 per cent of the population had been attacked by severe cholera, and the people obstructed all sanitary efforts. Through the influence of the medical staff of the Dublin University Mission, inoculation was permitted when the outbreak was at its height. A decrease in the epidemic began two days after the first inoculations were completed, and after the second injection, ten days later, fresh attacks ceased altogether. The effects of even the first injection convinced thirty-six sceptics, who came forward to be inoculated when the second injection was being given to the others.

TREATMENT.—Professor Bayliss³ suggested a trial in cholera of the gum solutions he found of so much use in shock after war wounds, usually with hæmorrhage; but Rogers⁴ reported that the method had been tried in Calcutta both by him at the Medical College Hospital and by A. Leverton, I.M.S., at the Campbell Hospital, with very unsatisfactory results. Professor Benjamin Moore⁵ subsequently gave biochemical reasons for the success of hypertonic salines and the failure of gum solutions in cholera. A. G. Varian⁶ writes on the great reduction in the death-rate of cholera since the introduction of **Hypertonic Salines** and **Alkalis** intravenously and **Permanganates** orally in its treatment.

REFERENCES.—¹*Ind. Med. Gaz.* 1919, 407; ²*Ibid.* 404; ³*Brit. Med. Jour.* 1919, June 7; ⁴*Ibid.* Sept. 20; ⁵*Ibid.* Oct. 18; ⁶*Dublin Med. Jour.* 1919, 66.

CHOREA.

Frederick Langmead, M.D., F.R.C.P.

Like most British observers, James Burnet¹ regards Sydenham's chorea as practically always rheumatic in origin, and is unwilling to accept a recent view that it is a manifestation of syphilis. He has placed on record three cases which had their origin in the presence of tapeworm, and were cured when the worm was expelled; even in such cases, he points out, there may have been a rheumatic tendency which rendered the nervous system unstable.

TREATMENT.—The treatment of chorea as generally carried out, he says, consists in keeping the patient in bed and prescribing arsenic in increasing doses; this is unsatisfactory in the highest degree. He then outlines the treatment which he recommends for all cases, no matter how apparently slight.

1. *Rest in Bed.*—The patient must be put to bed between blankets and kept there for six weeks at least. She must be kept amused by suitable books and toys, but no excitement must be allowed, and noisy brothers, sisters, and companions must be denied the sick-room. If the movements are severe, the limbs may be wrapped up in a light covering of cotton-wool to prevent injury,

while the head can be similarly protected. The heart must be examined carefully at every visit. Every choreic child will be found to have dilatation of the heart, whilst many will show more definite signs of endocarditis. Auscultation is insufficient, for percussion will often yield evidence of heart affection when auscultation fails in this respect.

2. *Diet*.—This must be light and suited to the patient's powers of digestion, which are often impaired. Milk is not altogether ideal, as, when boiled, as all milk given to children should be, it aggravates constipation or induces it. He prefers to add some food such as Mellin's or Horlick's or Benger's. Eggs, butter, milk puddings, soups, fish, chicken, and even minced mutton are all suitable articles of diet. Marmalade is better than ordinary jams. As the child improves, fat bacon, well frizzled, is a useful addition. Porridge is usually the best breakfast dish, and is almost always suitable. If ordinary oatmeal is not well borne, oatflour may be substituted.

3. *Massage*.—The reviewer is heartily in agreement with the author's remark that it is curious how little massage is employed in cases of chorea. As he says, the child is allowed to lie in bed, while its limbs get weak and muscles waste. Massage, he holds, is a very important part of the treatment of such cases and should always be carried out. It often helps to diminish the severity of the movements. He recommends that the limbs be massaged for a quarter of an hour night and morning with warm olive oil, preferring this to powder because it "is absorbed and aids in the nutrition of the muscles".

4. *Drugs*.—Salicylates are the drugs he advocates, and he prefers **Acetyl-salicylic Acid**, giving, say, 10 gr. thrice daily to a child of 5. To reduce the tendency which salicylates have to produce acidosis, **Sodium Bicarbonate** is usually given in combination with them; but, in his opinion, the latter tends to diminish the activity of the salicylate, and, if used at all, should be administered separately. He condemns the routine prescribing of liquor arsenicalis, and has known cases in which neuritis developed. Arsenic does not cure rheumatism, nor aid in warding off heart complications. When the movements are violent, **Chloral Hydrate** is very suitable, and may be given rectally when swallowing is difficult. Five grains may be given by the mouth every four hours to a child of 10 years.

5. *Convalescence*.—The child must not be allowed to return to play or to school too soon, and the heart should be examined from time to time. A change to the seaside usually aids in restoring the patient to health. [Many believe that an inland resort is safer for rheumatic children.—F. L.]. The clothing should be warm and light. Attention should be paid to boots and stockings as well as to underwear. **Cod-liver Oil** is the best tonic, and a course of **Iron** in the form of the saccharated carbonate is sometimes a useful adjunct. If the appetite is poor, a teaspoonful of **Compound Infusion of Gentian** may be given ten minutes before meals.

Throughout the course of the disease attention should be given to the stomach and bowels, and an occasional dose of **Grey Powder** or **Compound Liquefied Powder** is advisable. Every patient who has suffered from chorea should be kept under observation, and the fact that other forms of rheumatic infection are liable to ensue should be impressed upon the parents before taking leave of the case.

L. Porter³ has given an account of seven patients treated by injection of **Inactivated Normal Horse Serum** into the spinal theca. The first four patients received an initial injection of 20 c.c. half an hour after $\frac{1}{2}$ c.c. of the same serum had been given subcutaneously. Five of them were injected a second time on the fourth, fifth, or sixth day after the first; two patients received

10 c.c. only. In each instance an amount of cerebrospinal fluid greater than that of the subsequent injection was withdrawn; all the cases showed a high intraspinal pressure. Two sets of unpleasant reactions were caused by these injections—prostration, headache, and severe vomiting coming on soon after the operation, and distressing urticaria a week later, readily counteracted by subcutaneous injections of adrenalin. The results are described as encouraging, particularly in very severe cases; before the serum was used, two of the patients could be kept in bed only by the use of restraining packs, but less than forty-eight hours later each was able to carry a cup and drink without help; by the end of the third week choreic movements could only be elicited with difficulty. In future he intends to use smaller injections of not more than 5 or 10 c.c., repeated as required. [To the reviewer this kind of treatment seems uncalled for, and unnecessarily distressing for a choreic child, unless perhaps in cases exceptionally severe.—F. L.].

REFERENCES.—¹*Prescriber*. 1919. Oct., 169; ²*Brit. Med. Jour.* 1919, ii, 682.

CLAVICLE, SARCOMA OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Coley¹ comes to the following conclusions concerning sarcoma of the clavicle:—

1. Malignant tumours of the clavicle are comparatively rare, only 16 cases having occurred in upwards of 275 cases of sarcoma of the long bones personally observed. The greatest number belong to the sarcoma group, the few cases of carcinoma being metastatic developments from some recognized or unrecognized primary focus.

2. Sarcoma of the clavicle occurs more frequently in men than in women, probably due to the greater liability of the clavicle to injury in the male than in the female.

3. Sarcoma of the clavicle in the great majority of cases is associated with recent antecedent local trauma, either in the form of a direct blow or severe muscular strain.

4. DIAGNOSIS.—A clinical history of pain and localized swelling of the clavicle, usually following recent injury, with rapid increase in size, supplemented by a fairly characteristic x-ray picture, will usually make an early diagnosis comparatively easy without the necessity of an exploratory operation.

5. TREATMENT.—Local removal of the tumour, or even a limited, partial resection, should be avoided. The treatment of choice, while the tumour is in an operable stage, should be: (a) Total excision of the clavicle as soon as the diagnosis is made. (b) As soon as possible after operation, a course of systemic treatment with the mixed toxins of erysipelas and *Bacillus prodigiosus* should be begun, and continued for a period of at least six months. When possible this should be supplemented with local or regional treatment with radium or x rays.

6. The mortality of total excision of the clavicle under modern technique is so small as to be practically disregarded, and the functional use of the arm remains unimpaired.

In advising excision of the clavicle, many surgeons fail to emphasize the magnitude of such a procedure. The subclavian veins and artery, the pleura, and the cords of the brachial plexus must be carefully remembered. On the left side the thoracic duct may easily be wounded. In addition to cases of sarcoma, certain cases of necrosis, compound fracture, and gunshot injuries generally, may require this operation.

REFERENCE.—¹*Ann. of Surg.* 1920, Aug., 231.

CLEFT PALATE AND HARE-LIP.*Sir W. I. de C. Wheeler, F.R.C.S.I.*

Little has been written of a novel nature in connection with the repair of defects in the palate. The whole success of the operation depends on the making of ample flaps. There must not be any tension whatever when the freshened margins are brought together; if this golden rule be observed, it does not matter what form of sutures is used. The anterior angle of the cleft and the tip of the uvula require special attention lest they escape the knife in the freshening process. The uvula should be stitched first; bleeding must be checked by gentle pressure with a sponge, and time is saved by adopting

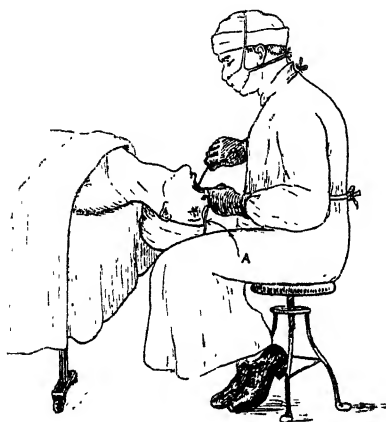


Fig. 15.—Drawing demonstrating position of the head of the patient over the end of the operating table, with the Connell-Y tube in place at A (see Fig. 16). Note the accessibility afforded, the good view of operating field, and the ease with which the surgeon is able to work on the roof of the mouth and the palate when the patient is placed in this position.

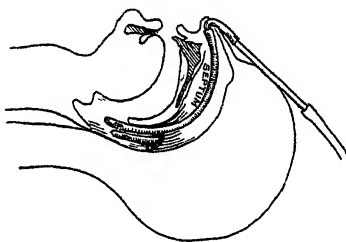


Fig. 16.—Sagittal section showing interior position of Connell-Y tube with catheters 12 cm. in length.

continuous pressure for a short time instead of indiscriminate dabbing, which excites movement of the palate and pharyngeal muscles. Operations on very young infants have not been followed by success in the hands of most surgeons, and the use of fancy operations such as the flap operation of Lane are avoided by most authorities.

A hare-lip should be first closed when the child is about six weeks old, and a cleft palate repaired at a second operation at the age of about five months.

Figs. 15 and 16, taken from a communication by Albee,¹ illustrate the position of the surgeon and a convenient way of administering the anæsthetic.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1920, Feb., 201.

COCYDYNIA.*J. P. Lockhart-Mummery, F.R.C.S.*

ETIOLOGY.—A paper by Frank C. Yeomans¹ points out the numerous theories that exist as to the cause of this condition: (1) The *neuralgic* theory—namely, that initial trauma causes violent nerve irritation, which persists without any demonstrable nerve lesion; (2) The theory that *neuritis* in several cases is the cause of the pain, traced to the pressure of the fœtal head on branches of the sacral plexus during labour; (3) The theory of *injury*, resulting in fracture, dislocation, ankylosis, or caries; (4) The *symptomatic* theory of referred pain of central origin, due to some functional or organic disease of the central nervous system such as hysteria, neurasthenia, or tabes dorsalis.

SYMPTOMS.—The general symptom is characteristic spasmodic pain localized to the coccyx and aggravated by sitting or rising. The importance of a careful examination to enable the case to be classified under one of the groups already mentioned is insisted upon, and to exclude any primary seat of trouble to which the coccydynia may be secondary, such as fissure, etc.

TREATMENT.—Yeomans considers that **Excision** of the coccyx is a simple operation, and usually efficacious, but believes that **Injection of the Nerve Tissues** in the neighbourhood of the coccyx should be tried first, and that excision should be reserved for cases where the injection has failed.

Technique.—The solution used is an 80 per cent solution of alcohol. This is injected with a hypodermic syringe of 2-c.c. capacity, the point of which is guided by a finger in the rectum, the object being to inject those parts of the tissue where the tenderness is most easily elicited, 10 to 20 min. of the solution to be injected at such points. The pain from the injected alcohol only lasts a few minutes, but a dull ache may persist for about twenty-four hours. Several injections may be necessary, at intervals of five to seven days.

The results in his own practice were : clinically cured 16, relieved 7, failed 1. In one case where injection had failed, a complete resection of the coccyx was performed.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1919, Dec., 612.

COLIC, INTESTINAL. Use of Benzyl Benzoate in (p. 6).

COLITIS IN CHILDREN. (*See* CHILDREN, GASTRO-INTESTINAL DISORDERS IN; INFANT FEEDING.)

COLON, MOBILE.

Robert Hutchison, M.D., F.R.C.P.

Waugh¹ has produced an elaborate paper on the morbid consequences of a mobile ascending colon in which he gives a good account of the morphology and development of the condition. He points out that the function of the ascending colon is unique, as it is the only section of gut that has to support semi-solid material against the action of gravity and to drive it vertically uphill. Mobility greatly interferes with the carrying out of these functions. In addition, the full weight of the loaded gut is distributed along the narrow line of the posterior attachment of its mesentery, and so pulls upon the right kidney, the second part of the duodenum, and, by radiation, upon the pyloric region of the stomach, the cystic duct, and in some cases the under aspect of the gall-bladder. To this he attributes such results as movable kidney, gastric and duodenal indigestion and even ulceration, gall-stones, etc., besides local pain and discomfort in the colon itself. Hence one gets cases of 'gastric', 'duodenal', 'biliary', 'renal', and 'right iliac fossa' type according to the character and localization of the pain. All these conditions can, he believes, be cured by the operation of **Colopexy** which he describes.

Morley² describes the clinical manifestations of a mobile proximal colon, especially of a chronic sort. In the more frequent type the patient complains of chronic constipation and pain in the right iliac fossa. The pain is usually worse after food, on exertion, and when the bowels are particularly constipated. It is described as a dull ache or a dragging pain, and the patient gives no history of a previous attack of acute appendicitis. There is often some associated sensation of flatulence and discomfort in the epigastrium, though this is more variable in its relation to the taking of food than in gastric or duodenal ulcer. Some tenderness on palpating the right iliac fossa is found on examination, and often palpable splashing and gurgling in a dilated cæcum. X-ray examination after a barium meal and enema affords valuable confirmatory evidence of the condition. When screened in the upright position the

cæcum and ascending colon are prolapsed, so that the hepatic flexure lies down on the false pelvis, and the cæcum may pass over the pelvic brim into the true pelvis. Screened in the left lateral position, the loaded mobile proximal colon sags across the mid-line to the left, and the cæcum may even be seen in the left iliac fossa. In this left lateral position the extent of attachment of the hepatic flexure can be most readily estimated.

On exploring the abdomen in such cases by an incision through the right rectus, the peritoneal attachments are found to be so lax that the cæcum and the greater part of the ascending colon can be lifted out of the wound well above the level of the abdominal wall. More often than not the appendix shows no signs of inflammation. The attachments of the hepatic flexure vary: in some cases a firm, broad peritoneal band containing some fibrous tissue fixes it to the lower pole of the right kidney (the nephrocolic ligament) or to the parietes close to the kidney or to the gall-bladder. In other cases the hepatic flexure is so singularly devoid of firm fixation that it can be readily drawn out of the wound along with the ascending colon.

Less commonly the patient complains, in addition to the symptoms already described, of sudden acute attacks of pain in the right iliac fossa, with a sense of swelling in that region, and often nausea or actual vomiting. These attacks seldom last longer than an hour or two, and may subside in a few minutes. When seen during such an attack the cæcum may be found greatly distended, and tender on palpation. The explanation of such sudden crises is to be found in a partial volvulus of the mobile ileocæcal region, or an acute kinking at the hepatic flexure.

The chronic symptoms—constipation and aching pain in the right iliac fossa—are not so easily explained, but the former is probably due to mechanical disability on the part of the mobile gut, and the latter to distention of the cæcum. Morley does not agree with Waugh that movable right kidney is often associated with mobile colon, and although he is convinced that patients with the latter disability are more liable than others to develop appendicitis, gastric and duodenal ulcer, and gall-stones, yet he is confident that the mechanical explanation advanced by Waugh to account for this association is untenable.

As regards treatment, he favours the plan of reducing the load of the cæcum and ascending colon by the method of Plication. Colectomy should be reserved for extreme cases.

REFERENCES.—¹*Brit. Jour. Surg.* 1920, Jan., 343: ²*Brit. Med. Jour.* 1920, ii, 542.

COLOSTOMY.

J. P. Lockhart-Mummery, F.R.C.S.

A new method of performing colostomy is described by Milton Linthicum.¹

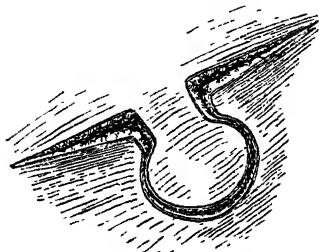


Fig. 17.—The incision.

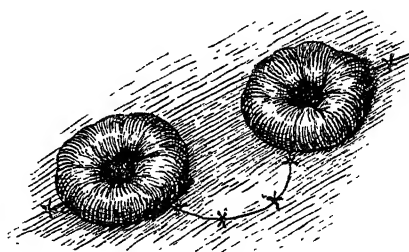


Fig. 18.—The completed operation.

The chief novelty lies in the shape of the incision. Instead of using a straight incision, this is diverted to one side so as to form a neck with a width of 1 cm.

to a button-shaped terminal of 1.5 to 2 cm. in diameter (*Fig. 17*). When the bowel is brought out, an opening is made through the mesentery, and the button-shaped flap of skin is brought through the opening and sutured back into its original position (*Fig. 18*). When the bowel is cut across, a distinct skin separation takes place between the two segments of the cut bowel, and thus a permanent spur is formed. It is claimed for this method of operation that no rod or support is required.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1920, Aug., 197

CONGENITAL HYPERTROPHIC PYLORIC STENOSIS. (*See STOMACH, SURGERY OF; also X-ray Diagnosis, p. 26.*)

CONGENITAL SYPHILIS. (*See SYPHILIS, INHERITED.*)

CONJUNCTIVA, DISEASES OF.

J. Burdon-Cooper, M.D., D.O.

Trachoma.—Hiwatari,¹ in a paper on the nature of trachoma and the normal histology of the conjunctiva, states that there is no adenoid layer in the substantia propria, but instead membranous histiocytes of Kiyona and a few plasma cells of Marschall. The former were considered to be plasma cells, and this confusion arose from the presence of so many so-called plasma cells, leading to the use of the term 'adenoid layer'. Follicles occur in the palpebral conjunctiva, because there the epithelial layer is thin and cylindrical, while on the globe it is thick and flat. Follicle formation is not the chief anatomical finding; fibroblastic proliferation and formation of scar tissue is equally important. The changes, apart from follicular formation, consist in a chronic subepithelial granulating inflammation, with increase of lymphocytes, plasma cells, histiocytes, and young connective-tissue cells, finally leading to cicatrization.

TREATMENT.—(*See also EYE AFFECTIONS, GENERAL THERAPEUTICS OF.*) Allan² sketches out the more or less orthodox treatment for trachoma. Frequent bathing with **Perchloride of Mercury** solutions 1–8000 should be employed. [In the experience of the reviewer nothing stronger than 1–10,000 should be used for the eye, and probably 1–20,000 for frequent lavage gives better results. Our aim is to assist nature, and strong perchloride solutions only necrose the tissues.—J. B.-C.] Some form of silver preparation is a *sine qua non*, the commonest being **Silver Nitrate** in strengths varying from 5 to 10 gr. per ounce—previous cocainizing being essential. With strong silver solutions it is necessary to wash out the conjunctival sac with normal saline. The organic forms of silver may be employed. Of these, **Protargol**, **Argyrol**, and of late **Protosil** would seem to be the most serviceable. McCallan says in his book on trachoma that the use of organic silver salts is merely palliative, and with this the writer is disposed to agree; and even the nitrate, after treatment is well established, gives relief, the patients even looking forward to the painting of the lids in preference to the irritation of the disease.

Brush Treatment.—Guiral³ has applied Howley's aspirating cannula for treatment of trachoma with good results, but it does not scrape off the granulations so well as the dentist's circular brush run by electricity. The small, narrow, rapidly revolving brush sweeps off the granulations without the slightest harm to the mucosa. Ether is given, and the lid compressed so as to expel the blood somewhat; then, after sweeping the conjunctiva clean, all blood and secretions, etc., are aspirated with the vacuum cannula.

At the clinics in Bordeaux Marque has collected 95 cases of granular ophthalmia which were treated by 'brossage' in 76.5 per cent, and speaks well of the procedure. In all his cases nitrate-of-silver and blue-stone treatment has resulted in failure, even when continued for a long time. The

results in treating trachoma by this means are symblepharon and entropion. Trachoma is one of the diseases in which no stereotyped line of treatment may be laid down; it varies with the variety, type, and intensity of the disease, and of the granulations. In the acute cases nitrate of silver is to be preferred, while in subacute and chronic cases 'brossage' and scarification or expression of granules may be necessary. **Carbon Dioxide Snow** has been tried with varying success, and subconjunctival injections of **Mercuric Cyanide** have been suggested. Frequently operative procedure is necessary.

Gerard¹ has elucidated a technique which he recommends highly. In 1916 he suggested that trachoma was a local manifestation of tubercle, and applied antituberculous drugs locally. He uses **Oxidized Naphthol-Camphor**—2 parts of camphor to 1 part of naphthol, warmed gently, filtered away from the air, and left to oxidize until it is of a mottled brown colour. The solution is carefully painted on the affected conjunctiva; care is taken to preserve the cornea, a piece of old linen being used to cover it and wipe the touched surfaces. Supplementary treatment commonly in use was the application of compresses of 1 or 2 per cent **Tincture of Iodine** in distilled water, and of weak **Zinc Chloride** drops. If severe watering occurs, he uses hot compresses of $\frac{1}{2}$ per cent solution of **Zinc Sulphate** twice or thrice daily.

Major Kirkpatrick² has an important little note on the use of **Magnesium Sulphate** for inducing osmosis and lymph-flow in diseases of the conjunctiva and cornea. He says eyes suffering from trachoma with secondary infections respond to the magnesium treatment in a gratifying way. He employs a solution varying from 40 gr. to the ounce to saturation, applied in an eye-bath for five minutes every two or three hours. Ulcers heal better, the pain is relieved, and osmosis and lymph-flow are promoted. The writer has made use for some years of **Hypertonic Solution of Sulphate of Soda** in the treatment of eye affections, and he generally incorporates in his eye lotions sulphate of soda of such a strength that it is slightly hypertonic to the tears. This greatly relieves pain, which would otherwise be produced in using certain drugs.

Malignant Pterygium.—Gonzalez³ publishes the result of another case of this disease, cured by subconjunctival injections of **Fibrolysin**, in which surgical treatment had failed several times. The pterygium covered half of the pupil, and a generalized conjunctivitis was present. Conservative treatment was adopted for the first three days. On the sixth day, after anaesthesia by cocaine and adrenalin, a 1-50 solution of fibrolysin was injected. Six injections were given, the strength being increased to 3 per cent at the fourth injection. The membrane over the cornea became more transparent, and after the sixth injection the body of the pterygium was much atrophied and very pale. The patient was discharged at the end of fifteen days.

Xerophthalmia.—Harry⁴ treats this complaint by a 2 per cent solution of **Chlorodyne in Liquid Paraffin**, the chlorodyne acting as an anæsthetic and the paraffin as a lubricant; in 1911 the same writer pointed out the value of this preparation in reducing such complications as symblepharon, entropion, xerophthalmia, etc. In epithelial xerosis the drops are used every two or three hours.

Ophthalmia Neonatorum.⁵—It is now generally conceded that a 1 per cent solution of **Nitrate of Silver** is as fully protective as 2 per cent, and so the weaker strength should be used. It is to be insisted upon that, whether aseptic or antiseptic methods of prophylaxis be employed, precautions against infection of the baby's eyes must be maintained throughout the whole lying-in period.

REFERENCES.—¹*Arch. of Ophthalmol.*, 1920, xlix, 82; ²*Prescriber*, 1919, Oct., 172; ³*Rev. de Med. y Cir.*, vii, 535; ⁴*Ann. d'Oculist*, 1919, Dec.; ⁵*Brit. Jour. Ophthalmol.*, 1920, June; ⁶*Med. Ibera*, 1919, iii, 80; ⁷*Prescriber*, 1919, Dec.; ⁸*Brit. Jour. Ophthalmol.*, 1919, Nov.

CONSTIPATION. 5-grm. extract of Beef Gall valuable in treatment (*p.* 6).

CRANIAL SURGERY.

J. Ramsay Hunt, M.D.

The Physiological Pathology of Gunshot Wounds of the Head.—An interesting monograph on this subject is contributed by Geoffrey Jefferson.¹ In analyzing the clinical histories of his series of cases, and weighing up the causes of death, and also of recovery, two facts stand out—the pre-eminent importance of anatomical injury, and of bacterial invasion, as rebels against the normal physiological processes of the cranial contents. Gunshot wounds of the head are generally fatal, not from toxæmia, but from mechanical interference with the bulbar circulation. The bulbar anæmia so produced is the result of a rise of intracranial tension above the normal, and is brought about in one of three ways: (1) By anatomical injury, including intradural hæmorrhage (subdural, subarachnoid, cerebral, and intraventricular) and traumatic œdema of brain tissue; (2) By infection, with the swelling of tissues and the exudates inseparable from it; (3) By a combination of the two foregoing entities—the common method.

Anatomical injury, primary tissue-destruction, is of paramount importance in the case of the brain, because of the physiological processes carried out by it, and on which that anatomical structure depends. It not only upsets the general bodily functions by toxæmia, but, more important, it occasions also a rise of intracranial pressure. Owing to the subdivision of the cranial chamber into incomplete compartments, the rise of pressure is not so rapidly fatal as would otherwise be the case, as Hill and Horsley and Spencer have shown. It is a truism of pathology that all organs swell when infected, and this is as true of the brain as of any other organ. But it is to the disadvantage of the cerebrum that nowhere can increase of size be so ill tolerated as within the rigid box of the skull. The inelastic cranium admits of but slight variations in the size of its contents, and this at the expense of the cerebrospinal fluid and circulating blood. Those who have seen the swelling of arms and legs from infected war wounds will realize how fatal such swelling must be within the confined cavity of the skull.

Cerebral injuries are infected with the same organisms as wounds elsewhere. Encephalitis, ventriculitis, and meningitis have been a deadly triad in the author's series, and have been responsible for most of the fatalities. Which is to say that if the patient survives the initial injury, and is able to compensate for the primary upset of intracranial physiology, the outcome will depend on the severity and extent of infection.

It is on these two factors, then, of anatomical injury and of sepsis, that the expectation of life depends, and these are the fundamental grounds upon which the problem of head wounds must be attacked.

The cases on which the author's observations are based were treated in the head service of No. 14 General Hospital, B.E.F., between July and October, 1918. They number 220, of which 54 were simple scalp wounds, 53 fractures without dural penetration, and 113 fractures with laceration of the dura. Some of them had already been operated upon in casualty clearing stations, and these previously operated cases are discussed separately (except the scalp wounds). He summarizes his results as follows:—

In gunshot wounds of the head, as in wounds elsewhere, the prime factors are the extent of the injury, the physiological disturbance produced by it, and the incidence of sepsis. Of the 130 cases in the series not previously operated upon, 29 died (19·3 per cent), all penetrating wounds of the dura of varying degrees. No case with an intact dura died. The mortality for penetrating wounds alone was 37·6 per cent. With the exception of four cases which

rapidly succumbed to the effects of the injury alone, all the deaths were due to infection. The inference that head wounds should be operated upon early is obvious. The common form of infection was meningitis, produced by spread either from the site of the wound, or by the medium of ventricular infection, which deposited the infection in the basal arachnoid cisterns (*Fig. 19*). This latter seemed to be the commoner route, and is undoubtedly of paramount importance. Three died from cerebral abscess. The nature of the infection is tabulated in the text. The bacteria present are much the same as in wounds elsewhere. The most deadly seems to be the streptococcus.

The importance of removing all indriven bone fragments cannot be over-emphasized. Bacteriological examination of the fragments showed them to

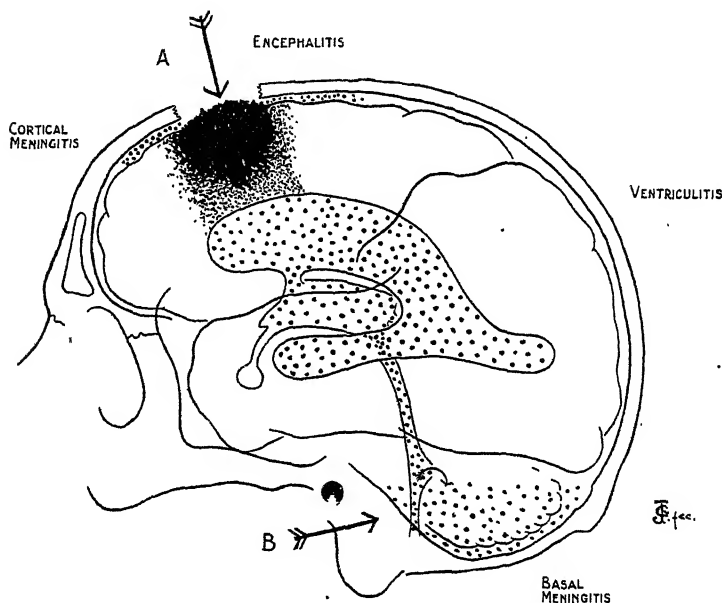


Fig. 19.—Diagram of common route of infection in head wounds. The local injury is sealed off by adhesions. (A) Local meningitis. (B) Basal meningitis, by ventricular infection escaping through the foramina of Magendie and Luschka.

By kind permission of the 'British Journal of Surgery.'

be heavily infected with both aerobes and anaerobes. An attempt was made to enumerate all fragments and locate their depth and direction.

From the neurological side, three distinct aspects can be discerned: (1) Signs of generalized intracranial disturbance, increased tension; (2) Localizing signs of cortical or projection fibre injury; (3) The meningeal syndrome. The meningeal syndrome was frequently present, often with a sterile cerebrospinal fluid, which may show a physiological leucocytosis and be quite turbid but be free from organisms.

Surgical Treatment of Brain Abscess.—A brain abscess may pass through three distinct phases, the initiatory, the quiescent, and the terminal. It should be operated on in the quiescent stage, not in the initiatory or terminal, as is frequently done.

The principal causes of pyogenic abscess are middle-ear disease, frontal sinusitis, and trauma. The abscess produced is single, and situated in the temporosphenoidal or frontal lobe, or at the point of the injury to the skull. A rather small percentage is situated in the cerebellum. Heimann reports a series of 570 cases of brain abscess of otitic origin, in which 457 were due to chronic otitis media and 113 to acute otitis media: this is significant evidence that brain abscess is prone to occur in chronic suppurative conditions, a theory which is borne out not only in chronic otitis media and frontal sinusitis, but also in cases of empyema, osteomyelitis, and general septicopyæmia.

A brain abscess may arise from an infected area and extend into the brain by contiguity, or it may develop at a distance from its etiological factor and be a part of a hæmatogenous or lymphatic infection.

During the initiatory stage, the process is more likely to be encephalitis or meningitis than cell destruction and pus formation; therefore very little can be accomplished by surgical intervention, as the encephalitis frequently continues and produces death. If the process becomes circumscribed and a true abscess forms, the encephalitis generally subsides, since the capsule becomes thickened and acts as a protection against the absorption of toxic materials. The brain abscess then produces symptoms of intracranial pressure and localization similar to those produced by tumour in the brain. The symptoms, such as delirium, coma, stertorous breathing, meningismus, dilated pupils, rapid pulse, and paralysis, which are usually considered diagnostic of brain abscess, are symptoms manifested in the terminal stage, indicative of abscess with diffuse encephalitis, which rarely can be checked by surgical treatment.

Adson² presents a review of 26 cases of brain abscess examined at the Mayo clinic during the last five years: the diagnosis in 23 instances was verified either by operation or by necropsy. The 26 cases are divided into two groups, non-surgical and surgical. The author's conclusions are as follows:—

The four principal etiological factors in the formation of abscess of the brain are otitic infection, frontal sinusitis, injury to the skull, and hematogenous infection. Brain abscess is usually single, except when it is of hematogenous origin associated with a general pyæmia, and then frequently it is multiple.

A brain abscess in its course may pass through the initiatory, the quiescent, and the terminal phase. The different phases can be determined more definitely from the history and duration of the complaint than from the physical findings.

If the abscess has developed by contiguity, it should be explored through the area of infection; but if the abscess is remote from the source of infection, it should be explored and drained through an osteoplastic flap craniotomy.

Surgical treatment is of little value in the initiatory or terminal stages, or in the presence of meningitis, but it is of great benefit during the quiescent stage. If there is doubt as to the differential diagnosis of brain tumour and brain abscess in the quiescent stage, it is advisable to explore rather than to perform a decompression operation for intracranial pressure, or to wait for terminal symptoms. (*See also* EAR DISEASE, INTRACRANIAL COMPLICATIONS OF.)

The Surgical Treatment of Gummatous Osteitis of the Skull.—Gummatous osteitis occurs in late syphilis, and involves the outer table of the skull alone, or the outer and inner tables with the dura and the brain. While the gumma may be an isolated condition, it is more likely to be associated with numerous lesions on the skull. In making an examination of these lesions, it will be found that there is a destruction of the superficial tissues with necrosis of the bone, which gives the peculiar moth-eaten appearance characteristic of this

disease, and affords a means of diagnosis, by Röntgen ray, before the skin has been broken down.

Aside from the specific treatment of syphilis, it is necessary that certain surgical measures shall be applied to the necrotic ulcers of the skull—namely, draining the suppuration, removing the sequestrum or dead bone, and stimulating granulation and epidermization over the denuded area.

A. W. Adson³ states that several cases have been observed at the Mayo clinic in which the skin has been elevated over a fluctuating mass varying in size from 0.5 to 4 cm. If the fluctuating area is opened, a sequestrum and pus are usually found, surrounded by roughened edges of bone. In the older lesions these fluctuating masses will open spontaneously, and pour out thick, yellowish pus, which is caused by necrosis of the superficial tissues and destruction of bone. The necrotic bone at first is very white and does not bleed when touched; but on exposure to air, it becomes discoloured, and a foul-smelling necrotic ulcer of the skull follows. The ulcers do not respond to specific treatment or local applications, unless the sequestrum has been removed. The necrotic areas may persist for years until sufficient necrosis takes place to loosen the sequestrum, when granulation follows.

The point under consideration is that in cases in which dry bone or necrotic suppurative bone is exposed, as in gummatous osteitis, granulation does not take place until the sequestrum has been removed completely, regardless of the depth of the sequestrum. A child on whom the author operated for brain abscess developed a wound infection, resulting in a retraction of the skin edges, and an exposure of the parietal bone over an area of about 9 by 6 cm. Various dressings had been applied with little success, when accidentally the child bumped her head, loosening the outer table of the exposed bone, which the writer then proceeded to lift off, thereby exposing the bleeding surface between the two tables of the skull. As soon as this was done, granulation immediately followed and the wound healed without skin-grafting.

In four cases of gummatous osteitis he has since applied the same principle, that is, elevating and freshening the skin margins and removing all the necrotic bone with a chisel to a depth at which bleeding is profuse. As a rule, if the necrotic bone is removed down to the diploe, no further procedure is required. When the inner table is involved, this also should be removed.

Local surgical treatment of gummatous osteitis depends on the size of the gumma and on whether or not the skin has been broken. In cases of very small gummas, it is unwise to open the fluctuating areas; if the gumma is 1 cm. in diameter or larger, it should be opened, the sequestrum removed, and the roughened edges curetted. In the larger exposed necrotic suppurating areas, all necrotic bone should be removed, the skin edges freshened, and wet dressings applied. Specific treatment should be given in conjunction with local treatment.

The principle applied to gummatous osteitis of the skull, with reference to removal of the sequestrum or dead bone, may also be applied to areas of exposed bone in non-syphilitic cases, since granulation will at all times be hastened by removal of the outer table of the skull.

Concussion Syndrome.—Lecène and Bouttier⁴ emphasize the great importance of this syndrome in the prognosis of head injuries. They affirm that the recent experiences of war surgery have shown the insufficiency of the classical theory of nerve molecular changes, and that very frequently the symptoms of concussion are dependent upon organic changes in the brain. This may be indicated by clinical evidence, or by histochemical examination of the cerebrospinal fluid. They give the typical concussion formula of the cerebrospinal fluid as follows: increased tension, marked hyperalbuminosis,

excess of sugar, the frequent absence of cellular reaction: which constitutes a dissociation or inversion of the usual albumino-cytological reaction. These findings suggest cerebral rather than meningeal traumatism.

In conclusion, they emphasize the importance, in estimating the prognosis in cranial injuries, of recognizing a pathological substratum which does not correspond to a gross lesion of the brain substance nor to a meningo-encephalic infection, but which does depend upon a diffuse concussion lesion of the cerebrum. The existence of such lesions has been confirmed by histological examination. These micro-traumatic lesions, which are distributed more or less diffusely throughout the brain mass, explain undoubtedly the chronicity of certain mental troubles which follow cerebral traumatism. The existence of the concussion syndrome and its persistence in certain chronic forms is of considerable medico-legal importance.

REFERENCES.—¹*Brit. Jour. Surg.* 1919, Oct., 262; ²*Jour. Amer. Med. Assoc.* 1920, Aug. 21, 532; ³*Ibid.* Feb. 7, 385; ⁴*Presse méd.* 1919, Nov. 12, 673.

CURETTAGE. (See UTERUS.)

CYANOSIS. For employment of Oxygen in, see p. 16.

DEAFNESS AND DEAF-MUTISM. (See also EAR, INNER; HEARING, MECHANISM OF; OTOSCLEROSIS.) *John S. Fraser, M.B., F.R.C.S.*

Sporadic Congenital Deafness.—Kerr Love¹ holds that hereditary deafness is Mendelian in incidence. Further, sporadic congenital deafness is hereditary, and such heredity is Mendelian. Kerr Love assumes that the reader is familiar with Mendelian phenomena as displayed by the crossing of tall and short peas and the subsequent self-fertilization of the resulting hybrids. Graham Bell, Fay, Kerr Love himself, and others have urged the heredity of many cases of congenital deafness; yet many people, and the deaf themselves, do not believe in the heredity of deafness. Why is this? (1) Because, as a rule, congenitally deaf parents have hearing children; and (2) Because hearing parents often have deaf children.

In the Ayrshire family, amongst over 40 deaf-born children, in only 2 cases can deaf parents be shown. In every other instance the deaf children come from hearing parents. For the sake of simplicity, Kerr Love gives an imaginary tree, every fact of which is present in the Ayrshire tree. A hearing husband marries an hereditarily deaf wife, and two deaf children result. Two hearing members complete the family. (It might quite well have happened that all four were hearing and that the deafness appeared in the grandchildren.) The oldest boy (A) hears and does not carry deafness (like the pure tall pea). Deafness never appears in this family so long as no member marries into a deaf family. The second child (B), a deaf girl, and the third, a hearing girl carrying deafness, marry hearing partners, and all have some deaf children or grandchildren. They are hybrid, and were the families large enough, about 1 in 4 would be deaf. In small families this ratio cannot be expected. In any individual family all may hear or all may be deaf, but on the whole the ratio is observed, and accounts for the fact that hereditary deafness forms a pretty continuous stream from one generation to another without much tendency either to increase or diminish. The fourth child, an hereditarily deaf man, marries an hereditarily deaf woman, and all the children are deaf.

We are not done with the parallelism of the pea and the child. A pure tall (A¹) may be crossed with a hybrid tall (B¹), and then all are tall though half are hybrid, and as long as hybrids meet any pure tall, only tall will result.

No.	NATURE OF UNION		RESULT			
	The double letter shows the nature of the parents responsible for the individuals here united		Pure hearing	Hybrid hearing carrying deafness	Deaf	
1	H. H.	× H. H.	Pure hearing ..	100	—	—
2	D. D.	× D. D.	Pure deaf ..	—	—	100
3	H. H.	× D. D.	.. ..	—	100	—
4	H. D.	× H. D.	Hybrid hearing	25	50	25
5	H. D.	× H. H.	.. ..	50	50	—
6	H. D.	× D. D.	.. ..	—	50	50

(Class 1: see above Table).—A hearing man, both of whose parents heard and did not carry hereditary deafness, marries a similar woman. No deaf children can result. This is the case in far more than ninety of every hundred marriages. (Class 2).—A deaf man, both of whose parents are hereditarily deaf, marries a similar woman, and all their children are deaf. This kind of union has occurred. (Class 3).—A pure hearing person marries a pure deaf-mute, and all the children hear. In Mendelian terms, hearing is dominant to deafness (recessive). From the Ayrshire tree one sees that several of the grandchildren were born deaf. (Class 4).—A hearing man carrying deafness marries a hearing wife carrying deafness, and both deaf and hearing children follow. The parents were hybrids like the first hybrid generation of tall peas. Deaf children *must* follow if the family be large. (Class 5).—A hearing man carrying deafness marries a pure hearing woman, and no deaf children result. But half the children will carry deafness, and if any of these wander into Classes 2, 3, 4, or 6—and they are sure to wander there unless guided by the kind of knowledge Mendelism gives us—deaf children will result. We cannot experiment with and label children as we can peas. Did these hybrids always marry pure hearing partners, no deaf children would ever follow. But this kind of marriage is common, and accounts for many of the puzzling cases of sporadic congenital deafness. (Class 6).—A hearing man carrying deafness marries a pure deaf woman. Half the children are deaf, and all the children carry deafness. This is a common type of marriage amongst the deaf, because the deaf and their hearing relatives are necessarily thrown much into common society.

Can Acquired Deafness lead to Congenital Deafness?—MacLeod Yearsley² gives a 'tree' which he claims as an instance in which a family with a history of acquired deafness (i.e., deafness appearing after birth) produced offspring that were born deaf. It is important to note that the so-called 'acquired' deafness was probably otosclerosis, and therefore, according to certain authorities, of hereditary character.

Reflex Signs useful in Examining for Deafness.—Stein³ holds that the following tests are useful in the case of young children, the feeble-minded, malingers, and hysterical subjects. (1) The auricular reflex is concerned with the motions of the external ear when subjected to a sudden and sharp sound. (2) The pupillary and (3) cochleo-palpebral reflexes are movements of the iris and eyelids respectively, occurring on the side under examination. In the performance of these tests it is important that they be made without the knowledge of the subject under examination. The best objects with which to make the tests are a shrill whistle or a bell with a spring hammer. The opposite ear canal is stopped and a blinker placed beside the eye next to the ear under examination. The patient's vision should be directed at a distance

to avoid fixation changes of the pupil. (1) A movement of the pinna, either as a whole or in part, takes place as soon as the sound strikes the ear. The extrinsic auricular muscles usually act in unison. (2) Reflex stimulation from sound causes a contraction of the pupil. The nerve fibres of the oculomotor nerve are the ones affected. (3) The winking of the cochleo-palpebral reflex takes place under similar stimulation.

Education of the Deaf.—Goldstein⁴ states that unfortunately the members of the medical profession know little or nothing as yet about the important problems of the deaf. It is difficult to interest even otologists in the problems. There is but one form of training for the congenitally deaf child, and that is the purely oral method, which should begin at the age of three or four years. The sign method and the manual alphabet belong to antiquated educational systems. Some congenitally deaf children at ten or twelve years are fluent lip-readers. It is, however, easier to teach lip-reading than to train a child in intelligible, normal speech. The child who has never heard the sound of the human voice is difficult to teach.

The problem of the deaf includes a careful consideration of the hard-of-hearing adults. The organization of leagues for the hard-of-hearing is important. Goldstein deprecates the employment of instructors who are themselves so defective in hearing that they can no longer appreciate the voice of a pupil in ordinary conversation.

J. D. Wright⁵ points out that the force with which sound waves impress the hearing mechanism varies inversely as the square of the distance from the source of the sound to the ear. A word spoken to a child one yard from his ear makes a certain impression. The same word spoken in the same pitch and volume one inch from his ear will make 1296 times as much impression upon his hearing organ. At least one-third of all the children who are proper candidates for schools for the deaf have some residue of hearing power. Every case should be treated on the supposition that there may be some remaining power of sound perception till long experiment has proved it otherwise. The physician should impress upon the parents the immense desirability of taking extraordinary pains that the little child shall hear, at distances of an inch or two if necessary, all the everyday language that any other child hears from morning to night. If the parents will talk to the boy while facing a big mirror and holding their mouths very near his ear, he can then both see their lips and hear their voices, and so get double help by means of both ear and eye. If these simple procedures were faithfully followed, thousands that now reach the school as deaf-mutes would come merely as hard-of-hearing children with well-developed minds.

The Outlook for the Deaf.—Annetta Peck⁶ calls attention to the determination of the deafened man to be wretched, his insistence upon being left alone in a misery which he considers hopeless, and his deep hostility towards any efforts to help him. The impulse to rise and win must almost invariably be applied from without, by appealing to the need for economic independence and easier communication. It should be the duty of the otologist to see that boys and girls whose hearing is even slightly affected shall be instructed in lip-reading, and then trained for occupations in which a possible increase of deafness will present no barrier to success. Cases with low morale are very difficult. Lastly, we have the rare cases of persons determined to have their hearing back—the irreconcilables who waste time and money, often on quack remedies. Deaf people of great wealth support every philanthropic project under the sun, but refuse to finance reclamation work among those labouring under the same handicap as themselves. The reason doubtless lies deeply hidden in the uninvestigated psychology of acquired deafness.

Economic Aspect of Deafness.—Storey⁶ holds that the besetting sin of his afflicted brethren is fear and its various derivatives, timidity, self-consciousness, and sensitiveness. They are afraid of becoming conspicuous, of being laughed at. The deaf person, though cultivated, feels his inferiority in social intercourse to the most callow youth. To live alone is the line of least resistance. There is a great danger of the deafened falling in the economic field into the hands of the selfish exploiter of labour. Lip-reading and electrical devices are by no means perfect substitutes for hearing, but Storey holds that to be really 'successfully' deaf one should be a skilled lip-reader. Storey (who is a lawyer) confesses that he is a very poor lip-reader. The public has its typical psychological reaction to the deafened man. Pity, not unmingled with impatience, and then indifference, is the lot of most deafened people. In the business world a deafened man is apt to be grateful for the opportunity to work at a congenial task, and therefore to be enthusiastic over it.

Estelle Samuelson⁷ states that employers report about their hard-of-hearing employees as follows: A hard-of-hearing person is more efficient at general routine work, because he is accustomed to monotony and isolation. He is an asset in a business office because he concentrates better than others. He does more work in less time than a hearing person, because he does not engage in the constant chatter going on about him. He is reliable and appreciative of his employer's effort to train him, because he recognizes his limitations and does not seek constant change. He is a master of detail.

Artificial Aids to Hearing.—Mailand⁸ divides artificial aids to hearing into six groups: (1) Funnel-shaped ear trumpets which collect a large number of sound waves and conduct them to the ear, and also act as resonators for certain tones. Deaf patients get the best results with the apparatus which acts as a resonator for those tones which they have greatest difficulty in appreciating; for this reason it is best for the patient to try out a large number of hearing trumpets. (2) The tubular form of hearing apparatus, which often works exceedingly well. It is, however, only suited for hearing one person at a time. (3) Apparatus which conveys the sound waves by bone conduction to the cochlea—e.g., the dentophone and the audiphone. These are not of much use. (4) Artificial drum-heads, of which the simplest and best is a small ball of cotton-wool inserted in the region of the stapes and oval window. (5) The various forms of electrical aids to hearing. Tigerstedt has constructed an electrical aid in which the ear-piece is so small that it can be worn in the external meatus. It must be admitted that electrical apparatus is expensive, and that batteries must often be renewed. (6) The last group includes all the 'humbug' apparatus. These instruments are all small and of little use, but relatively dear. Mailand advocates the formation at certain centres of a collection of different forms of hearing apparatus, so that patients can try various kinds under the guidance of an otologist.

REFERENCES.—¹*Jour. Laryngol. Rhinol. and Otol.* 1920, xxxv, 263; ²*Ibid.* 270; ³*Laryngoscope*, 1919, xxix, 657; ⁴*Ibid.* 1920, xxx, 479; ⁵*Ibid.* 597; ⁶*Ibid.* 490; ⁷*Ibid.* 501; ⁸*Acta Oto-Laryngologica*, 1920, vol. ii, Fasc. 3, 366.

DEFICIENCY DISEASES.

J. A. Nixon, M.D., F.R.C.P.

Food deficiency diseases continue to be the subject of much careful clinical study and experimental investigation. They may be considered, in the light of our present imperfect knowledge, as falling into two groups: (1) Avitaminoses; (2) Those due to undefined and possibly multiple factors. But in both groups the opinion is gaining ground that it is the absence of certain substances from the food that causes the diseases. Gowland Hopkins¹ claims that vitamins, although still of unknown nature in the chemical sense, are not

merely hypothetical. The existence of these accessory factors in nutrition is now sure, and needs no further evidence. The diseases which he classes as avitaminoses are scurvy, beri-beri, xerophthalmia, and rickets. The most striking evidence that the antiscorbutic substance (if there be only one) is of a special nature lies in the fact that, while absent from dry grains, it appears suddenly when the grains are allowed to germinate. Rickets he regards as due to more than one factor. Mellanby,² from his own observations on puppies, inclines to the view that in rickets it is an excess of carbohydrate in an unbalanced diet which is largely responsible for the disease, and that it is the special function of the antirachitic accessory factor to prevent the abnormality. In this connection McCarrison's³ work becomes very illuminating. His observations were referred to at length in the MEDICAL ANNUAL for 1920, p. 83. Briefly, according to him, vitamins are not foods in the sense of tissue builders or producers of energy; they aid the body to utilize food material sufficiently, and its cells to perform its functions. He draws attention to the fact that dietetic deficiencies have profound effects on endocrine activity, and further that dietetic deficiencies have a profound effect on the digestive organs. Ill-balanced diets affect the endocrine glands through four factors, acting in varying combinations according to the quality of the deficient food. These factors are: (1) Deficiency of vitamins; (2) Deficiency of suitable protein; (3) Disproportionate values of starch or fat, or both; (4) The fortuitous occurrences of pathogenic agents in the body. Chick and Dalyell,⁴ working in Vienna, have made some valuable observations on the importance of quantity when dealing with accessory factors in nutrition. Foodstuffs must not be labelled as containing these factors, but as containing them in different degrees. It is not enough to know that a particular accessory factor is present in the diet; there must be enough of it.

Hess and Unger⁵ would limit the proved avitaminoses to two—namely, scurvy and beri-beri. Rickets, they contend, cannot be placed in quite the same category, since it can be brought about by overfeeding. In scurvy and in beri-beri we do not meet with the strong, apparently healthy babies found in rickets. Infants develop the latter while receiving the full amount of fat-soluble vitamins. These authors are even doubtful whether it is a disorder of dietetic origin at all. There is a parental factor involved; the negro infant, living side-by-side with the white and obtaining milk from the same source, develops rickets so frequently and so markedly as to indicate that there are other influences to be reckoned with beside food. Here perhaps McCarrison's suggestions come to help us to realize that although the interfering influences may be very complex, the end-results are true deficiencies. A nutritional 'deficiency' may be pictured as (a) an inability to get; (b) an inability to absorb; or (c) an inability to use. The first may be illustrated by scurvy and beri-beri, the second by the familiar instance of the inability to absorb fats in sprue, and the third by the inability to use carbohydrates in diabetes. McCarrison's experiments indicate that these possibilities must be explored separately and in combination before we arrive at definite conclusions as to the parts played by dietetic deficiencies, digestive derangements, or endocrine defects in what are now termed deficiency diseases. From this standpoint the Pellagra Committee Report⁶ makes an important suggestion—"In pellagra the deficiency is believed to be one of protein of the right biological value, . . . a deficiency of aromatic amino-acids". Research into the nature and constitution of vitamins is only in an early stage. Hart, Steenbock, and Ellis⁷ found that summer-pasture milk is richer in antiscorbutic vitamins than dry-fed milk or winter-produced milk; this vitamin is readily destroyed by drying and storage. Steenbock suspects that it is generally associated or

identical with certain yellow pigments of plant tissues. Rosenheim and Drummond⁸ failed to establish the identity of fat-soluble A with any known lipochrome pigment, though they think it is in some way associated with this class of substances. The lipochromes are substances which the animal organism seems unable to synthesize for itself, and for their supply depends on plant products. The colour of body-fat, milk-fat, or egg-yolk is derived from the lipochrome pigments ingested in the diet. There is a striking correlation between the distribution of the fat-soluble vitamins and the lipochromes. Food-stuffs rich in the one appear likewise rich in the other. Myers and Voegtlin⁹ have worked for some time at the isolation of the antineuritic vitamin¹⁰ from brewers' yeast. They have obtained a liquid that can be crystallized, and contains substances of the nature of histamine. The effects of the absence of particular amino-acids from an otherwise full vitamin diet has been commented on by Gowland Hopkins, who states that the deprivation of tryptophane produces effects, especially in the case of various glands, similar to those described by McCarrison. A lack of tryptophane in the protein of maize has been suggested as one of several factors responsible for the production of pellagra.

SCURVY.

A comprehensive study of scurvy has recently been published by Hess.¹⁰ His book is the first in the English language that has been written since Lind's work of 1753. It is impossible to give anything like a full abstract in this article. One of the most important statements that Hess makes refers to the discovery of the Just-Hatmaker process of drying milk whereby the antiscorbutic vitamin is preserved. Another point to be observed is the readiness with which this vitamin is destroyed by alkalis. Harden and Zilva have shown that by evaporating lemon-juice to dryness in an acid medium an active dry residue is obtained. Givens proved that orange-juice reduced to a powder by means of a spraying process loses little of its antiscorbutic factor. The favourable influences under which the antiscorbutic vitamin withstands drying are rapidity of desiccation and an acid reaction. But few more important discoveries have been made than Fuerst's, that dried peas if allowed to germinate regain their antiscorbutic properties.

Hess draws attention to the frequent occurrence of subacute and latent scurvy in infants. Both conditions often escape correct diagnosis. 'Subacute infantile scurvy' usually affects the baby in the second half of the first year of life. The child ceases to gain weight, it is sallow, with perhaps slight oedema of the upper eyelids. It is peevish, and its appetite is capricious. There may be slight lividity of the gums or peridental hæmorrhage. Here and there on mucous membranes or skin there may be a petechial spot. Tenderness of the lower thighs may be present, with slight oedema over the crests of the tibia of the kind which does not pit on pressure. The knee-jerks are markedly exaggerated. The urine is diminished in volume, but is generally normal or contains a trace of albumin and red and white corpuscles. The pulse is frequently rapid, or becomes rapid and irregular on the slightest excitement. The respirations are also rapid. Radiograms of the bones may show the 'white line' described by Fraenkel, or a thickening of the periosteum. Latent scurvy is diagnosed mainly by a reaction to specific therapy in an infant aged about six months that has ceased to thrive, to gain satisfactorily, to look healthy, and to feed as it should. This condition is probably the commonest type of the disorder, especially in the larger cities where almost the entire milk supply for infants is pasteurized.

In the scurvy of adults, as well as that of infants, the skin and nails are

altered by the nutritional condition. The skin becomes dry, the nails are thin and brittle; the hair also becomes thin and dry, and characteristic petechial hæmorrhages may develop at the roots. The skin changes may amount to an actual eczema, which reveals its nature by yielding promptly to an antiscorbutic. A similar skin lesion constitutes one of the typical signs of pellagra, and eczema has been described in infantile beri-beri. Hess and Unger have described a scorbutic beading of the ribs, a 'rosary' like that of rickets. This is probably responsible for much of the confusion which exists as to the association and differentiation between these two diseases. Early scurvy is often called chronic rickets. The beading, however, differs from that of rickets. It is more angular, the junction taking on a step-like form as if the abutting of bone-ends and cartilage were of unequal size and fitted badly to each other.

TREATMENT.—Hess summarizes the treatment as follows. In the absence of fresh food, germinated dried pulses and seeds are valuable protectives. No reliance can be placed on dehydrated vegetables. Canned tomatoes, owing to the acid they contain, possess a high degree of antiscorbutic power; it is probable that most acid fruits and vegetables are able to withstand the canning process. Alkalinization of milk is responsible for much scurvy among infants. It has also been shown that the addition of sodium citrate to milk destroys the antiscorbutic vitamine. Lemon and orange juices can be dried (by evaporation in a vacuum) and still retain their antiscorbutic value. Hess advises that in these days of pasteurized milk and manufactured infant foods, fruit or vegetable juices should be given to babies earlier in life than is customary. Swede-juice, orange-juice, canned tomatoes, potato cream, may be used. "No one," he says, "has reported success with any drug."

RICKETS.

It has not yet been conclusively proved that rickets is a pure food-deficiency disease, nor that it is an avitaminosis. The part played by the so-called antirachitic vitamine, or fat-soluble A, was fully discussed in the MEDICAL ANNUAL for 1920, when it was admitted that the responsibility of this factor in the prevention of rickets was not proven. Gowland Hopkins¹ considers that Mellanby's experiments demonstrated the influence of a specific diet-deficiency, at least in the production of this disease in dogs. That more than one factor is concerned in the causation seems sure. Hess and Unger⁵ claim that the results of their experiments in infant feeding showed that the fat-soluble vitamine is not the much-sought-for antirachitic factor, and that, even if rickets is in some degree influenced by a fat-soluble vitamine deficiency, there are more important factors at work. Gowland Hopkins has pointed out that the supply of fat-soluble vitamine in the diet which the infants received in Hess and Unger's experiments was by no means negligible. Mellanby's² further experiments, and the remarkable absence of rickets among the inhabitants of the Island of Lewis which he quotes in support of his conclusions, go far to justify his verdict that diet is everything to infants under one year old, and so long as this is good, bad hygienic conditions are of small significance. He holds that rickets depends on a relative insufficiency in the diet of the antirachitic vitamine; that the influence of this factor is enhanced by anything which stimulates metabolism, such as high protein in the diet, and exercise; while excess of carbohydrate, especially if it leads to a laying on of fat, is antagonistic to the vitamine. Hess and Unger claim, as stated above, that there are important influences to be reckoned with besides the food. It has been shown, however, that pork-fat, of which negroes are very fond, contains scarcely any fat-soluble vitamine (McClendon). Corry Mann¹¹ has mentioned

a most important contributory factor in the causation of rickets, to which almost no attention has been paid—namely, that the incidence of rickets in working-class families increases as wages fall in districts where casual labour is constantly present. This increase of rickets corresponds with an increase in the number of married women who take work at low wages when their husbands are unable to find employment.

Whatever the individual factors are whose absence contributes to the causation of rickets, there is ample evidence to prove that, where fresh milk is lacking for infants, rickets will appear. The experiences of Chick and Dalyell in Vienna only confirm those of Engel¹² at Dortmund in the Ruhr Valley. When fresh milk is unobtainable, Cod-liver Oil offers the most compact, most portable, and most storable remedy.

Rickets, Late Rickets, and Osteomalacia.—As the result of post-war food shortage, Beninde¹³ has described numerous cases in Prussia of a bone disease which resembles the more severe forms of rickets, late rickets, and osteomalacia. The disease falls into three groups or types according to the patients' ages. The first group consists of children under 5 years old. The clinical picture is characterized by pain in the bones upon movement, softening, curving, and increased friability of the bones, and craniotabes. Children affected do not learn to walk until late, sometimes as late as the sixth year. Those between the second and sixth years of age usually forget how to walk.

The second group consists of children between 14 and 19 years of age; children between 6 and 14 are rarely affected. The clinical picture is that of late rickets. It is seen most often in males whose bones are overtaxed by long standing, by much walking, or by carrying heavy weights. In the first stages pain develops in the overloaded bones, but disappears during rest. Later, thickening and curvature result, and the epiphyses become painful to pressure. The x-ray picture shows ragged, indistinct epiphyses and a lighter area at the ends. Spontaneous fractures may occur which heal with the formation of a pseudarthrosis.

The third group consists of persons above 19 years of age. Most of the sufferers are women between 40 and 60 years of age, especially during pregnancy and the puerperium. Like osteomalacia, the disease affects principally the legs and the spine, and manifests itself by severe pain, curving, and increased friability of the bones.

BERI-BERI.

Sprawson¹⁴ gives an account of beri-beri in the Mesopotamian Force from 1915 to 1919. The disease with which he deals presented all the clinical features of beri-beri. He divides the cases into three groups: (1) British cases, among the land forces; (2) Chinese cases, amongst labourers on land; (3) Ship cases, amongst Indian crews. Sprawson thinks that, although clinically and pathologically the cases seemed identical, yet the etiology differed. He is of the opinion: (a) That the British cases were not due to food deficiency, but were of infective origin; (b) That the Chinese cases had suffered previously from beri-beri, or else that a previous dietetic deficiency rendered them liable to develop beri-beri when exposed to illness, fatigue, or other depressing circumstance, though at the time their diet was not deficient in vitamins or other essential factors; (c) That the ship cases were orthodox beri-beri arising from recent vitamin deficiency. Sprawson conjectures that the British cases may have been examples of infective polyneuritis as described by Rose Bradford. Clinically there is no resemblance between the description given by Sprawson and infective polyneuritis as seen in France during

the war and in England since. There is little in Sprawson's paper to shake the evidence that beri-beri depends on a vitamin deficiency, or to diminish the value of Willcox's¹⁵ observations on the influence of diet in the production of beri-beri among the British troops in Mesopotamia. In 1915 over 300 cases occurred in British troops. Owing to the inadequacy of transport and the long distances from the base, fresh meat and vegetables were not available for the troops at the front, so that the basis of the ration was tinned beef, bread or biscuits, jam, and tea. The British bread and biscuits were made of white flour from which the germ and aleurone layer had been removed, thus depriving them entirely of anti-beri-beri vitamins. The British soldier in this way became liable to beri-beri, and in many cases fell a victim to the disease. The Chinese developed the disease owing to their refusal to eat any rice except the polished variety.

Walshe,¹⁶ in an exhaustive review, has summed up the facts relating to the nervous lesion of beri-beri and its bearing on the nature and cause of the disease. He quotes the words of Eijkman that even though we hold the vitamin-starvation theory, the ultimate cause of beri-beri may yet prove to be a poison produced by a disordered metabolism arising out of vitamin deprivation. For the present this statement could scarcely be bettered.

TREATMENT.—Fortunately the treatment of beri-beri is more certain than its pathogenesis. Willcox has shown conclusively how the British troops in Mesopotamia came to suffer from a deficiency of the antineuritic vitamin in spite of an apparently abundant diet; he mentions the articles which, when added to the diet, avert beri-beri or cure it when it develops. These articles may be exemplified by Fresh Orange-juice, Fresh Lemon-juice, Raw Egg, and 'Marmite'. In some instances the addition of 'Atta' to the bread-flour or to the rice, cured and prevented the disease.

PELLAGRA.

The most important work which has up to the present been published on pellagra is the Report of the Committee of Inquiry.⁶ Scientific investigations of the utmost value were carried out among Turkish prisoners of war in Egypt. Large numbers of prisoners suffering from pellagra came into our camps. The report contains definite and instructive conclusions as to the causation of the disease. The negative conclusions require first consideration, since they clear the ground of plausible but untenable hypotheses. There is no proof of case-to-case infection, nor of local or locational infection. There are no proofs of bacterial or protozoal infection. The positive conclusions are interesting and suggestive, but they seem to bring us only to the threshold of new discoveries. There is reasonable evidence for regarding pellagra as a disease in which defective protein supply to the body is a prime causal factor. Further, it seems clear that protein starvation may occur even though an adequate quantity of protein is ingested. This may depend on the quality of the protein, upon what Wilson terms its 'biological value', or upon the inability of the individual to absorb and make use of protein of good biological value.

Goldberger and Wheeler¹⁷ produced experimental pellagra in male white convicts who volunteered for the test. These authors conclude that pellagra developed in at least six of the eleven volunteers as the result of their diet. The factors to be considered as possibly essential to the production of the disease are: (1) An amino-acid deficiency; (2) Faulty mineral supply or constitution; and perhaps an as yet unknown (vitamin?) factor. Williams' and Hunter's¹⁸ observations support the view that the basal factor is dietetic. Bigland,¹⁹ while admitting that there is a definite connection between food

deficiency and pellagra, considers that there are cases in which no food deficiency (even from the standpoint of biological values) has existed. He suggests that a 'toxin' factor may be present in such cases which interferes with protein assimilation. Both this author and Enright²⁰ suggest that this toxic substance may exert its influence through the endocrine glands especially. Visiwaligam²¹ concludes from his observations that faulty diet in itself cannot cause pellagra, but that there is a superadded infection. White,²² however, in his description of pellagra at Port Said, observed that the causal factor in that outbreak seemed to be entirely dietetic, and that the disease was eradicated by correcting the faulty dietary, all other conditions remaining the same. In regard to the theory of transmission by means of a biting fly (*Simulium*), nothing in the nature of a protozoal cause could be discovered, nor could any connection with biting insects be found.

Roberts²³ sums up the present position fairly:—

1. Pellagra has been reported from Canada to Chile, and the profession should be on the look-out for it in the Western hemisphere.

2. It has probably caused 500,000 cases and 50,000 deaths in the United States in the last twenty years.

3. The number of cases appears to be decreasing, and the types tend to be more mild and chronic.

4. Pellagra *sine* pellagra is of importance, because it is more difficult to diagnose than when the eruption is present.

5. Goldberger has shown that the disease can be caused by an improperly balanced diet and cured by a balanced diet, with accent on lean meats, eggs, butter, milk, and vegetables containing proteins.

6. Cases of pellagra occur in families that have abundant food of great variety. There are certain people who, although they have such a diet provided, do not eat it, and so develop the disease.

7. In treatment, diet is of consuming importance, and drugs are of minor value, though in certain cases useful.

Mental Conditions in Pellagra.—Miller and Ismail²⁴ agree with Tanzi, who says of the pellagra psychosis: "It is an intermittent and progressive amentia, which, if not cured or not early fatal, terminates in dementia". Insane pellagrins, once in hospital and taken as a group, are not regarded by alienists as being either determinedly suicidal or highly dangerous to others. The prognosis, if not cured before the asylum stage is reached, is bad as regards mental recovery.

FAMINE DROPSY.

Nixon²⁵ observes that the names hunger- and war-œdema are modern titles for an old disease well known before the war as famine dropsy. He defines the condition as a form of dropsy associated with bradycardia, polyuria, and asthenia, which occurs in persons subjected to prolonged underfeeding. It is unattended by albuminuria, or by cardiac dilatation or neuritis. Physical exertion and exposure to cold accelerate its onset. The disease is independent of renal or cardiac disease, and also of beri-beri, scurvy, or pellagra. The symptomatology was fully described in the MEDICAL ANNUAL for 1920. From a survey of reports on blood and urine analysis, there appear to be no changes in blood or urine which cannot be explained as the normal outcome of deficiencies and excess in the food constituents. The constant alterations in the composition of the blood are hydræmia, hypo-albuminosis, and deficiency of lipoids. It has been suggested that the lipid deficiency may affect the permeability of the capillary walls so that œdema occurs.

PATHOGENESIS.—Cornish,²⁶ in his remarks on prison dietaries and the Indian

famine of 1877-8, attributed the appearance of dropsy to inadequate nitrogenous rather than non-nitrogenous food. His views attracted little attention at the time, and secured for him marked disapproval from the Indian Government. His pioneer work is now fully appreciated. McCarrison,²⁷ who speaks with the utmost caution of his studies as barely begun, sums up their significance as bearing upon deficiency œdemas thus: "The adrenal glands, and in males the pituitary body, enlarge as the result of dietetic defects. The adrenal content is in excess of normal when the food is deficient in vitamins and in proteins, and unduly rich in starch; it falls below normal when the diet is scorbutic, or when there is concurrent infection. Œdema is associated with enlargement of the adrenals in pigeons fed on autoclaved rice, though adrenal enlargement may be present without œdema. The œdema seems to bear some relation to the adrenal content of the enlarged glands: when œdema occurs, the content is found to be high; when the content is low, œdema is absent although the glands are enlarged". McCarrison suggests that an excess of adrenalin may reach the kidneys direct and interfere with the normal excretion of urine, thus favouring the retention of fluid in the tissues. This explanation is scarcely applicable to famine dropsy, where polyuria is the rule and a diminution in the secretion of urine is never observed. Denton and Kohman²⁸ state that dropsy occurred in rats fed on a carrot diet when the proportion of nitrogen was reduced by the addition of some non-nitrogenous food such as fat or starch. Kohman²⁹ found that the addition of fats, or fat-soluble A, or of common salt, had no effect in producing œdema. But œdema was more marked when there was much water in the diet than when the animals were on a dry diet. Maver³⁰ has confirmed these observations. The evidence at present points to the conclusion that the deficiency is not that of a single food factor, but is rather a combined deficiency in protein, in carbohydrate, and calories. It is clearly not an avitaminosis. Possibly an excessive intake of fluid is essential to the production of this variety of œdema.

TREATMENT.—The majority of cases are cured in a short time by rest in bed, warmth, and a diet rich in carbohydrates. Recent researches, however, emphasize the necessity for an adequate supply of protein, as being no less important than a calorie sufficiency. Co-existing diseases must be treated; diarrhœa is especially troublesome and apt to relapse. Deaths are usually due to concurrent disease, particularly tuberculosis. The simplest and most compact remedy for famine dropsy is **Cod-liver Oil**. The prevention of the disease is solely a matter of diet. When, in a diet which contains an excessive amount of fluid, the protein content falls below 50 grms. per diem and the calories below 1200, famine dropsy or deficiency œdema occurs in man.

REFERENCES.—¹*Brit. Med. Jour.* 1920, ii, 147; ²*Lancet*, 1920, i, 856; ³*Ind. Jour. Med. Research*, 1919, vi, 275; vii, 269; and *Brit. Med. Jour.* 1920, i, 249; ii, 154, 236, 822; ⁴*Brit. Med. Jour.* 1920, ii, 151; ⁵*Jour. Amer. Med. Assoc.* 1920, lxxiv, 217; ⁶"Report of a Committee of Inquiry regarding the prevalence of Pellagra among Turkish Prisoners of War (Cairo)," *Jour. R.A.M.C.* 1918, 1919, xxxiii, 426; ⁷*Jour. of Biol. Chem.* 1920, xlii, 383; ⁸*Lancet*, 1920, i, 862; ⁹*Jour. of Biol. Chem.* 1920, xlii, 199; ¹⁰*Scurvy Past and Present*, Philadelphia, 1920; ¹¹*Brit. Med. Jour.* 1920, i, 157; ¹²*Lancet*, 1920, i, 188; ¹³Verosoffentl. a. d. Geb. d. Medizinalverw. 1920, x, 121 (abstr. in *Surg. Gynecol. and Obst.* 1920, Sept., 194); ¹⁴*Quart. Jour. Med.* 1920, 337; ¹⁵*Brit. Med. Jour.* 1920, i, 73; ¹⁶*Med. Science*, 1920, ii, 41; ¹⁷*Arch. of Internal Med.* 1920, xxv, 451; ¹⁸*Med. Record*, 1919, xvi, 492; ¹⁹*Lancet*, 1920, i, 947; ²⁰*Lancet*, 1920, i, 998; ²¹*Jour. Trop. Med. and Hygiene*, 1920, xxiii, 46; ²²*Lancet*, 1920, ii, 412; ²³*Jour. Amer. Med. Assoc.* 1920, lxxv, 21; ²⁴*Lancet*, 1920, ii, 788; ²⁵*Bristol Med.-Chir. Jour.* 1920, xxxvii, 137; ²⁶"A Reply to Sir R. Temple's Minutes", *Madras Government Minute*, 1877; and *Madras Quart. Jour. of Med. Science*, 1865, 8; ²⁷*Brit. Med. Jour.* 1920, i, 236; ²⁸*Jour. of Biol. Chem.* 1918, xxxvi, 249; ²⁹*Amer. Jour. Physiol.* 1920, li, 378; ³⁰*Jour. Amer. Med. Assoc.* 1920, lxxiv, 934. See also Maase and Zondek, *Das Hungerödem*, Leipzig, 1920.

PLATE XIV.

DELHI BOIL



J. H. Stowers.

By kind permission of the 'Proceedings of the Royal Society of Medicine'

PLATE XV

DELHI BOIL



Case of cutaneous Leishmaniasis of lupoid type affecting upper lip. The white area is covered by dry epithelial scales. Cured by a few intravenous injections of 1 per cent tartar emetic. Patient caught the disease in Persia.

By kind permission of the 'British Journal of Surgery'

DELHI BOIL (Cutaneous Leishmaniasis). (*See also KALA-AZAR.*)*E. Graham Little, M.D., F.R.C.P.*

Several cases of this condition, formerly almost unknown in England, have been met with since the return of our soldiers from Eastern theatres of war. Stowers¹ showed at the Dermatological Section of the Royal Society of Medicine a very typical case, and has kindly allowed the reproduction of a painting (*Plate XIV*) which illustrates the condition. The patient was a European lady living in Lahore. The lesions first showed themselves as two nodules under the right eyelid, and later a single nodule on the forearm. Leishman bodies were demonstrated in scrapings by Prof. Castellani.

Cope² describes the following clinical types; the papule; the rounded ulcer; psoriasiform patches about the elbow; lupoid and syphiloid ulcers, the differentiation of which from lupus and syphilis is made by the observation that the ulceration is too rapid for syphilis, too slow for lupus. Rarely, the lesion may be mistaken for an epithelioma.

Infection usually occurs in exposed parts, face (*Plate XV*), hands, or forearms. Insect bites are a very usual preliminary to infection. It has been proved by experimental inoculation that the lesion may take as long as six months to show. One attack seems to confer an immunity. Diagnosis is best established by the demonstration of the characteristic Leishman bodies in scrapings of tissue (e.g., from the edge of an ulcer).

This causation should be suspected in the case of indolent ulcerations in persons coming from parts of the world where Leishmania is common.

TREATMENT.—In an interesting discussion which took place at the Royal Society of Medicine on a case presented by Prof. Castellani,³ that author gave reasons for preferring the intravenous injection of **Tartar Emetic** to local application of ointments (e.g., 5 per cent in vaseline) containing that drug, a treatment advocated first by G. C. Low, and used with success in some cases. Castellani is convinced that the infection by the time it shows locally is really already generalized, and consequently deprecates merely local treatment. But in some cases where tartar emetic has failed, or been slow in influencing the disease, he has preferred **Emetine** in hypodermic injections given near the site of the sore. He used initial doses of $\frac{1}{2}$ gr. of tartar emetic, increased to 2 gr.

Cope considers **X rays** may be a curative agent in many cases, but he also prefers intravenous injections of tartar emetic, 5 c.c. of a 1 per cent solution being an average initial dose, which may be increased to 7.5 c.c. given at intervals of four to seven days. Eight or more doses may be required.

(*See also p. 35.*)

REFERENCES.—¹*Brit. Jour. Dermatol.* 1920, xxxii, 263; ²*Brit. Jour. Surg.* 1921, viii, No. 31, 259; ³*Brit. Jour. Dermatol.* 1920, xxxiii, 59.

DEMENTIA PRÆCOX.*Bedford Pierce, M.D., F.R.C.P.**Marguerite Wilson, M.B., Ch.B.*

Etiology and Pathology.—At a discussion on dementia præcox and its relation to other disorders, at the Cambridge meeting of the British Medical Association,¹ Bernard Hart in the opening paper first asked, To what extent does dementia præcox constitute a definite entity? and concluded that it may be regarded in the sense that it marks off a group of cases with notable similarities in their symptomatology, course, and outcome, although the borders of this group cannot be accurately defined.

The next question he raised was, What is the essential morbid process in dementia præcox? The² physiogenic theories depend upon the presence of histological changes in the brain and other organs; but so far no specific characteristic degenerative lesions have been demonstrated. Reference was

also made to the atrophic changes in the testes and ovaries described by Mott. Besides these are the suggestions of some auto-intoxication or failure of internal secretion.

Although none of these can be considered uniformly associated with this disorder, it is admitted that the physical changes which accompany dementia præcox are so pronounced that it is difficult to accept a purely psychogenic causation. Freud's and Jung's theories that this disease is a persistence of, or a regression to, an earlier stage of mental development, and that the withdrawal of interest and the emotional dullness are due to a failure of adaptation, do not cover the whole facts, and Hart endeavours to combine the physiogenic and the psychogenic points of view. "On the one hand, the indubitable pathological findings in cases of any standing, the incidence of heredity (which Rüdin claims to have a Mendelian distribution), the progressive and deteriorating course of the disease, so unlike the course observed in disorders known to be predominantly psychogenic in origin, all make it extremely difficult to accept any purely psychogenic theory of causation. On the other hand, it is equally clear that the psychological theories put forward by Freud and Jung, however much these may differ from one another in certain details, provide a satisfactory basis into which the facts of clinical observation can be accurately fitted, and offer an explanation of the disease more comprehensive and illuminating than any of the physiogenic theories yet proposed. It would seem, therefore, that any adequate formulation of dementia præcox must combine both the physiogenic and psychogenic points of view; that the strife as to an 'either—or' must necessarily be sterile, and that the final solution will be found in a 'both—and'. The direction in which this solution may be sought will perhaps prove to be in the conception of a biological reaction, the adaptation or attempted adaptation of an individual with a certain make-up to the environment in which he has to live, and which is capable of being expressed in both physiological and psychological terms. Clearly such a conception is in accord with the psychological theories which have been proposed, and it is not impossible to believe that the psychological reactions are the obverse of physiological reactions in which the pathological facts so far observed will be found to fall easily into their place."

In the discussion which followed, Archdale objected to the use of the term dementia præcox on account of the pessimism it involves. The diagnosis is most discouraging for the physician, the nurse, and the relations, and is often misleading. He suggested the desirability of appointing to every hospital medical men specially trained in psychological research, as he considered such a line of approach the most likely to be successful in obtaining greater knowledge of this disorder.

Stanford Read considered the bulk of evidence was in favour of the psychogenic origin of dementia præcox. He stated that psychiatrists of repute had reported recovery from analytic treatment, and had no doubt that absolute recoveries do occur. This makes it difficult to accept the theory of neuronie degeneration.

Bedford Pierce stated that little more could be done to arrest the progress of dementia præcox than was possible when Haslam described the condition in 1807. Although modern psychology had done much to explain the mental mechanism of the disorder, it failed to explain why A progresses and B regresses; why B pulls down the blinds and closes the shutters, and A opens the windows and rejoices in human intercourse. He referred to four surprising spontaneous recoveries, and the possibility of this should be remembered when the value of new methods of treatment is estimated. He thought that the most prominent line of investigation into the cause of this disorder would

be found in the study of disordered functions of the sexual and accessory sexual glands.

Devine considered that dementia præcox could not be considered a definite entity, on the following grounds: (1) The absence of bacteriological or serological tests; (2) The absence of definite post-mortem criteria; (3) The lack of specific characteristic symptoms; (4) The fact that the symptoms are not necessarily significant of deteriorating psychosis. He considered the term 'schizophrenia' preferable. In reference to causation, he looked upon the disorder as a "constructive effort on the part of a biologically inferior individual to make an adjustment to internal difficulties". Analysis showed that the defect of adaptation was mainly in the sexual sphere.

David Blair objected to the label dementia præcox. He referred to a case which presented catatonic signs for over five years, followed by recovery. This patient has remained in normal health for six years.

Rivers objected to the various theories being regarded as opposed to one another, and believed that this disorder, as other mental disorders, should be looked at from three points of view—the physical, the psychological, and the biological. Of these he considered the psychological the most important. Seeing that dementia præcox is frequently preceded by special mental tendencies in childhood, he hoped the time would come when these could be recognized early and the education adjusted accordingly.

Helen Boyle confirmed the previously expressed opinion that a number of patients with symptoms indistinguishable from dementia præcox did recover, and considered that an entire change of surroundings was frequently beneficial, apart from psychological treatment.

Sir F. W. Mott² says that the importance of the sexual function in the etiology of insanity is manifest, owing to the frequency of mental disease during adolescence and at the climacteric. The demonstration of regressive changes in the sexual glands in dementia præcox gives further evidence in the same direction. But the question arises, Is the mental disorder caused by the degeneration of these glands either by the disturbance of the endocrine system, or by the suppression of normal sexual impulse, or is the degeneration a part of an inherent lack of vital energy? Mott considers the latter is most probably true, as in dementia præcox there is a general lowering of vital reactions, with morbid changes most marked in the cortex, especially in the nuclei of the nerve-cells. In many cases the nuclear decay of the brain and the reproductive organs begins long before puberty. Attention is drawn to Kraepelin's description of the symptoms of dementia præcox, and the differentiation of the fundamental simple weak-mindedness (the weakening of judgement, loss of creative activity, and dullness of emotional interest) from the secondary accompanying phenomena due to disruption of harmonious psychical interconnections (hallucinations, negativism, mannerisms, etc.). He agrees that it is not due to masturbation, that it arises in uncivilized races, and concluded that it must be of endogenous origin. The histological findings of a number of pathologists are briefly described, and it is shown that in this disease there is a parenchymatous degeneration of the neurones, with comparatively slight affection of vascular and supporting tissues. Mott's own investigations of eight cases confirms the conclusion of others. He states that the major part of the fundamental symptoms are due to functionally incapacitated or degenerate neurones. The greater part of the neurones are living, but so biochemically altered that progressive loss of function results. In particular, attention is drawn to the cytoplasmic changes in the layers of granules (intercalary neurones). Besides swelling of the nuclei, there is evidence of deficient oxidation. This is supported by qualitative chemical

analysis. The suggestion is made that the essential cause of this disease is an inborn germinal defect, the nature of which is unknown. "Nature is unmindful of the individual, mindful only of the species, and by early mental decay and arrest of spermatogenesis reproduction of a degenerate being is thereby prevented." The article concludes with an account of the histological findings in ten cases, and there are many beautiful coloured plates of microscopic findings.

Rawlings³ investigated twelve cases in which he found uniform pathological changes, due neither to arteriosclerosis, nor senility, nor long-continued toxic processes. Microscopically the condition found is—swelling of the cell-body and nucleus of the brain-cells, breaking-down of normal nuclear chromatin structure, and later atrophy and fragmentation of the neurofibrils, with subsequent granular degeneration and irregular clumping of Nissl's granules. The terminal condition depends on the degree of vicious influence and the original resistance of the cell. It may be: (1) Moderate atrophy, followed by more or less acute fragmentation; (2) Extreme pyknotic atrophy (shrunken cell and prolongations with incrustations), or atrophied nucleus surrounded by fragmented rim of half-granular protoplasm.

The Adrenalin Test in Dementia Præcox.—It has been claimed by various authors that the injection of adrenalin is of great use as a confirmation test in dementia præcox. In normal persons as a rule it causes a rise in blood-pressure. In cases of dementia præcox, especially of the hebephrenic and catatonic types, it has been stated that there is no rise. Lawrey⁴ says the test is of little value, and that certainly it has not the value claimed for it. In 60 test cases observed by him, 54 had a rise in blood-pressure after the injection.

Re-education in Dementia Præcox.—W. A. Bryan⁵ gives an outline of systematic efforts made at the Danvers State Hospital to re-educate demented patients. Encouraged by the success in the re-education of disabled soldiers, special courses of instruction have been devised to awaken new interests in chronically degraded patients, with some measure of success. The training is directed to the formation of new habits, and it is claimed, first, that a strong new incentive must be devised; second, that continual repetition of the prescribed routine is essential without any breaks; third, that the work given must not be too difficult. A new department has been set aside, connected with the gymnasium and play-room. Great pains are taken to provide the æsthetic surroundings. Classes are held for five and a half hours daily, with a break for the midday meal. Special occupational teachers are employed in addition to the nursing staff. The play instinct is first utilized, and every session begins with fifteen minutes' work with the medicine ball. It is reported that very few cases, however apathetic and apparently demented the patients may be, fail to show some response. Next comes the tearing of rags or picking cotton, and useful work is quickly undertaken. Following this comes weaving with hand looms, and then occupation work with the insets devised by Dr. Montessini, and at the same time knitting, sewing, paper-folding, and simple basket-making. Later, further Montessini educational methods are followed, relief maps constructed with sand, clay modelling, raffia work, and the like. Great care is exercised over personal appearance, button and lacing frames are in regular use, and there is daily tooth-brush drill. The actual routine followed is prescribed specially in each case. The scheme has only been in operation for eighteen months, but it is claimed that the atmosphere of untidy wards has undergone an entire change, the demands on the laundry are lessened by one-half, many patients are markedly improved, and not a few have been transferred to better wards.

REFERENCES —¹*Brit. Med. Jour.* 1920, ii, 470; ²*Proc. Roy. Soc. Med.* (Psychiat. Sect.), 1920, June 26; ³*Jour. Amer. Med. Assoc.* 1920, March 20, 826; ⁴*Boston Med. and Surg. Jour.* 1920, Aug. 12, 209; ⁵*Amer. Jour. Insan.* 1920, July, 99.

DENGUE.*Sir Leonard Rogers, M.D., F.R.S.*

M. D. Levy¹ describes an outbreak of dengue at Galveston with about 5000 cases, beginning after the arrival of marines from a dengue-infected West Indian island, while the disease was a coastal one. The saddle-back curve was seen in most of the cases. The absence of Koplik spots differentiated the rash from measles. Sodium Salicylate and Sodium Bicarbonate often relieved the pains better than aspirin or phenacetin.

REFERENCE.—¹*Med. Record*, 1920, June, 1040.

DENTAL SEPSIS IN CHILDREN.*Frederick Langmead, M.D., F.R.C.P.*

With F. St. J. Steadman one wonders why our profession does not appreciate more vividly the vital effect of dental sepsis on the physique of the race. The reports concerning the state of recruits' teeth, and its consequences on their health from the various commands, recently brought before the Inter-departmental Committee on the working of the Dentists Act, serve to place the question beyond argument. Steadman¹ deals in a recent paper with the effect of marked dental sepsis on the health of children, and with the treatment of those all too common cases in which the proper prophylactic and remedial measures have not been carried out, so that the child has advanced caries in one or many teeth.

Children with dental sepsis, he says, look pale, tired, and sleepy, their eyes lacking the normal lustre of healthy children. A considerable number of children were weighed before and after treatment, and a rapid increase was often noted. One of the chief ways by which dental sepsis in children produces loss of mental and physical growth is by reduction of sleep, and a careful investigation will frequently disclose that for months the child has not slept well. Gastro-intestinal disorders are a common result, as evidenced by gastric and abdominal pain, offensive diarrhoea with much undigested food in the motions, marked wasting, fretfulness, night-terrors, loss of appetite, sleeplessness, and pallor. He instances a case of this kind in which the patient, a child of 7, had been treated for fourteen months by her doctor, who had advised that the teeth should on no account be removed for fear of injuring the permanent ones. Treatment of the advanced caries found to be present resulted in recovery of health in three or four weeks. That dental sepsis and not imperfect mastication is the cause is proved by the fact that health is restored soon after the dental extraction and almost before the gums have healed. Anæmia of other than dental origin is liable to be aggravated by the chronic toxæmia associated with dental sepsis, and other chronic diseases, such as tuberculosis, cannot but be prejudicially affected. Typhoid and scarlet fever and other zymotic diseases are more dangerous if dental sepsis is present. Further, septicæmia or endocarditis is an occasional result.

Turning to local effects, the writer speaks of pharyngitis, tonsillitis, otitis media, and enlargement of the lymphatic glands. A very slight septic focus in children will often lead to enlargement of the glands. Though glands often rapidly diminish in size after the removal of septic teeth, they do not quite disappear. Years later they occasionally enlarge again, and examination may show them to be tuberculous. J. G. Turner has shown that sepsis in the deciduous teeth not uncommonly leads to damage of the permanent teeth below them. Lastly, the carious teeth by disuse lead to a gingivitis, which may spread to the periodontal membrane and add pyorrhœa alveolaris and all its ill effects. This review of the results of dental sepsis in children is by no means complete.

Steadman has treated between 7000 and 8000 children, a considerable proportion of whom showed marked improvement in general health, and none

of whom were adversely affected as the result of removal of their septic teeth. He removes all deciduous teeth in which the decay is sufficiently advanced to infect the pulp, and generally their antagonists also. By this is not meant exposed pulps, for many pulps are infected long before they are exposed. Permanent teeth he treats in the same way if the roots are incomplete at the time of the pulp infection. A point on which he lays emphasis is the advisability of removing all the necessary teeth at one sitting.

REFERENCE.—¹*Lancet*, 1920, i, 303.

DERMATITIS.

E. Graham Little, M.D., F.R.C.P.

Ragweed Dermatitis.—Sutton¹ discusses the phenomena of anaphylaxis, and reports 4 cases of ragweed dermatitis, in 2 of which a *Pollen Vaccine* was used with benefit. The doses and intervals are not specified. The susceptibility of the patient may be tested by dermal tests with pollen, as there are several varieties of plants, with varying reactions. The technique is described as follows :—

A known amount of pollen is placed in a small sterile mortar, together with a few drops of sterile water. The pollen is then thoroughly triturated, being ground repeatedly until, when examined under a microscope, it is found that the grains are completely broken up. The mixture is then diluted with decimal normal salt solution, to which 10 per cent of glycerin and 0.5 per cent of phenol (carbolic acid) have been added, so that 1 c.c. of the mixture contains 10 mgrms. of pollen. The same preparation may be used for treatment; but if so the solution should again be diluted serially, in order to guard against possible overdosage. The initial dose should be small, not more than 0.0001 to 0.0003 mgrm. of pollen protein. Afterwards, the dose may be increased, depending on the reaction secured. A safe plan is to inject the vaccine every third or fifth day, increasing the amount injected from 10 to 30 per cent each time. Occasionally the ensuing reaction is very severe and even violent; and it is wise always to have conveniently at hand atropine and epinephrin solutions, in case they are needed. The local treatment is that of an eczema.

Nasal Dermatitis.—Morley Agar² produces convincing evidence of a curious complex of symptoms which he ascribes to a chronic dermatitis, with fissures, of the nasal vestibule. Besides the disfiguring redness of the nose which results from this condition, it is common to find that the victim suffers from a severe paroxysmal rhinorrhœa, asthma, 'hay fever', and allied effects. The dermatitis may be cured and the whole train of symptoms eliminated by a very simple procedure. The vestibule, that is to say, the in-turned skin of the nostrils, is carefully examined for any fissures or sore spots, and a note made of their whereabouts; it is then rubbed with a lotion of *Silver Nitrate*, 30 gr. to the ounce. The rubbing is carried out thoroughly and systematically. Particular attention is paid to two spots: the first is high up on the outer wall, and the second on the floor about half to three-quarters of an inch back from the orifice. No part of the vestibule must be missed, and the nostril must be stretched to open up the folds. The mucosa should be avoided as far as possible. The painting should be repeated daily, or every two days, until there is no hypersensitiveness of the vestibule. Between these applications the following lotion may be painted on the same parts two or three times daily :—

R	Acidi Carbolici	℥ iij	Spiritus Vini Rect.	ʒ iv
	Olei Menthe Piperitæ	℥ vj		
	Misce. Fiat pigmentum.			

Copra Dermatitis.—Ditlevsen³ reports an interesting epidemic of an eruption affecting workmen unloading copra from three ships in Copenhagen. The

initial lesions were noted one to two days after contact, and were very itchy, and attended by glandular swellings, and some fever (39° C.). Portions of the parasite, but not a living specimen, were demonstrated in the copra, and are regarded by the author as identical with the acarus first described by Castellani and recorded in the *MEDICAL ANNUAL*, 1916, p. 204.

Dermatitis from Barley Mite.—Loir and Legangaux⁴ record an epidemic of an itchy eruption occurring in workmen unloading at Havre a cargo of barley from Bizerta. The eruption developed within two or three hours of handling the grain. Many acari identified as pediculoides were found in the barley dust. Treatment as for scabies produced a speedy cure.

Dermatitis due to Hat Linings.—Battmann⁵ notes a curious little epidemic of skin eruptions traceable to hat linings made of substitutes for leather rendered necessary by war shortage. The eruption took the form of an acute erythematous eruption distributed at the site of contact of the inner hat lining. The severe forms simulated an erysipelas. Treatment was very simple, and consisted in 1 per cent Resorein lotions and powdering with an inert powder.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, Nov. 8, 1433; ²*Brit. Med. Jour.* 1920, July 24; ³*Arch. f. Schiffs- u. Tropenhyg.* 1919, Dec., 503; ⁴*Bull. de l'Acad. de Méd.* 1919, lxxxii, 308; ⁵*Munch. med. Woch.* 1920, March 5, 291.

DHOBIE ITCH. (See FUNGI, THE HIGHER, IN HUMAN DISEASES.)

DIABETES INSIPIDUS.

John D. Comrie, M.D., F.R.C.P.

Various writers, e.g., Lereboullet,¹ have recorded the successful use of **Pituitary Extract** in diabetes insipidus. In most cases the diminution of the polyuria is merely temporary for a day or so after each injection, but Chauffard² records a case in which the benefit continued, and in which the effect was also produced when the pituitary extract was administered by the mouth. As a rule the latter method of administration has no effect. Maranon and Gutierrez³ record in three cases a diminution of polyuria simply from **Lumbar Puncture** and withdrawal of cerebrospinal fluid, which was under pressure.

REFERENCES.—¹*Paris méd.* 1919, Nov., 353, also *Presse méd.* 1919, Dec., 746; ²*Med. Press and Circ.* 1920, Aug., 142; ³*Siglo méd.* 1919, Sept., 809 (abstr. in *Jour. Amer. Med. Assoc.* 1919, Nov., 1649).

DIABETES MELLITUS.

John D. Comrie, M.D., F.R.C.P.

With regard to our knowledge as to the nature of this disease, a considerable amount of experimental work has been carried out by Allen¹ and by Langfeldt.² The former experimented by removing the pancreas of dogs in part, and thereafter testing the effect of diet upon the resulting glycosuria. He considered that he had demonstrated that there is no inherent progressiveness of the diabetes in early stages, but that, by appropriate restrictions in the diet, animals exhibiting a state of potential diabetes through deprivation of part of their pancreatic tissue could be caused to gain in tolerance and to maintain a condition of health. Langfeldt gives an elaborate account of two years' research work on dogs after partial resection of the pancreas; his findings all confirm the predominant rôle of this organ in the development of diabetic phenomena, the secretion appearing to have a catalytic action. Delatour³ also performed a series of researches on the blood-sugar in depancreatized dogs, and concluded that sugar injected intravenously could not be metabolized by these animals as it could be by the healthy dog. Apolloni,⁴ who records a case of diabetes associated with pancreatic calculus and fibrosis, and

Winternitz,⁵ who found marked hyaline degeneration of the islands of Langerhans in another diabetic, appear to corroborate these experimental researches as indicating that anatomical changes in the pancreas are responsible for some cases at least of diabetes. On the other hand, Allen and Mitchell⁶ report a case of hereditary diabetes (7 diabetics out of 14 brothers and sisters), in which a post-mortem examination was performed immediately after the death of the patient, his pancreas histologically examined, and reported upon by three skilled pathologists, who could find nothing whatever abnormal save some general shrinkage of the acini, the result of inanition before death. Labbé,⁷ who examined the pancreas in a large number of cadavers with the object of tracing some regular anatomical change in association with diabetes, found the same pathological changes in diabetics and in non-diabetics with about equal frequency. We must not therefore invariably incriminate the pancreas in diabetes. Farges⁸ attributes diabetes to the perversion of the glycogenic function of the liver, and Geelmuyden⁹ found in ten cases of diabetes that after death the liver contained an excess of glycogen and of fat; the surplus being specially high in cases where death had resulted from acidosis. Allen¹⁰ reports a case of hepatic cirrhosis with hyperglycæmia, in which death took place suddenly from coma resembling acidosis.

The connection between diabetes and diseases of the endocrine glands has received a good deal of attention. Among others Labbé¹¹ described several cases of diabetes co-existent with exophthalmic goitre, and states that there is in these cases an exceptional tendency to acidosis, while the diabetes is more resistant and less amenable to diet restriction than usual. Langdon Brown¹² draws attention to the same fact, and considers that the excess of thyroid secretion may help to tip the balance towards diabetes in a person whose metabolism is wavering.

'Renal' *glycosuria* is now well recognized as a type of the milder cases, and, as Allen¹³ points out, is not so uncommon as was formerly supposed. It is not yet proved that the nature of the disease consists merely in a greater permeability of the kidney to sugar when the quantity of this rises in the blood. The glycosuria, however, as he found in three cases carefully examined, depends directly upon dietetic excess, especially of carbohydrates, but also of proteins; though the fat ration and total metabolism are not of the importance they are in true diabetes, and there is no tendency to acidosis. The characters which warrant a diagnosis of this condition, according to Paullin,¹⁴ are: the constant presence in the urine of glucose, not greatly altered by increasing the carbohydrates only of the food; a normal amount of blood-sugar; and the absence of the constitutional symptoms of diabetes. Galambos¹⁵ also considers that the disease is of more frequent occurrence than its recognition implies; and while he finds the blood-sugar habitually low, he states that the glycosuria is increased by applying the tolerance test of administering at one time 100 grms. of glucose. Salomon,¹⁶ who finds this 'diabetes innocens' relatively frequent in Vienna, recognizes different types, in some of which the amount of glucose in the urine is readily increased by addition of carbohydrates to the diet, while others are but little affected in this way. From the point of view of life assurance, Williamson¹⁷ recommends that this tolerance test should be performed in cases which show glucose in the urine once, with subsequent disappearance. It is carried out by giving 100 grms. of glucose dissolved in $\frac{1}{4}$ litre of water or tea, upon an empty stomach, before breakfast. The urine may be tested at three-quarters of an hour and two hours afterwards. The perfectly healthy person, in whom the presence of sugar at the original examination was a mere accident due to dietetic excess, will show no glycosuria

after 100 grms. of glucose, and may be accepted; while the finding of glucose in the urine after this tolerance test shows defective metabolism or impaired kidney function.

The glucose 'excretion threshold', which may be defined as that percentage of sugar in the blood at which glucose begins to appear in the urine, has been the subject of study by Rathery and Gruat,¹⁸ who arrived at several definite conclusions. It should be explained that in diabetes and other conditions a kind of protective mechanism is established by the kidney to prevent the draining away of glucose from the organism, so that the excretion threshold is raised and tends to prevent wasteful loss of sugar from the body. Claude Bernard originally declared that 0.3 per cent of sugar in the blood indicated the maximum threshold and a permanent glycosuria; and it has been found that the normal varies in different individuals somewhere between 0.06 and 0.12 per cent. Rathery and Gruat find that a high threshold does not necessarily imply a case refractory to dietetic treatment, nor does a moderate threshold always go with a mild type of diabetes, as has been alleged. They find that variability of the threshold in any given diabetic is of good prognosis as indicating controllability of the disease, while a high level that does not fluctuate at all is of grave significance. Chabanier and Lebert¹⁹ have found that this threshold can be greatly influenced by certain drugs, especially by glandular hormones; thus injections of suprarenal extract and of pituitary extract have the effect of raising the threshold, while phloridzin, as is well known, lowers it. An elaborate study of blood-sugar concentration in 228 cases of various diseases has been made by Rohdenburg and others,²⁰ who conclude that there is no fixed character of its reaction to carbohydrate ingestion in diabetes, any more than in the blood of such widely different conditions as tuberculosis, epithelioma, and pregnancy; and therefore the concentration of the blood-sugar cannot be regarded as the sole factor concerned in the development of glycosuria.

The increasing prevalence and mortality of diabetes have been noticed by various writers, but no very definite figures are available as to the general prevalence. From the number of persons at the Hague who applied for special privileges in rationing during the war, Hoogslag²¹ calculates that there are about 11,000 recognized diabetics in Holland, or 1 in 600 of the population. Geyelin²² states that, while it is generally accepted that severe cases of diabetes are commonest in the first three decades of life, after the age of 30, in his experience, the severity increases with the age. Brigham²³ concludes that the number of diabetics could be tremendously reduced by the prevention of obesity. This observation is fully borne out, as regards America, by the statement by Mr. Hoover, the Food Controller, quoted by Joslin,²⁴ that in the United States the consumption of sugar per individual has risen to nearly two pounds per week! Juvenile diabetes is regarded by Horowitz²⁵ as being not so fatal as generally supposed, provided the children can be tided over an acute period by suitable dietetic restrictions, and he considers that intestinal toxæmia has a powerful influence in these cases. Some interesting observations have been recorded by McCay and others²⁶ upon diabetes among the Hindus of India. They show that the meat-eating, hard-working Mohammedan escapes, while the Hindu, living under similar conditions as to climate, disease, etc., is very prone to diabetes; this they attribute to the causative influences exerted by the ill effects of a prolonged and excessive, one-sided, carbohydrate dietary on the Hindu. It is a true diabetes from the first, but of a very mild type, and patients very rarely die of diabetic coma. The urine can in general be rendered sugar-free by a low carbohydrate diet of some days or weeks, and thereafter the tissues, by gradual building-up of the diet, are re-educated to

utilize carbohydrate more fully. Albuminuria accompanying the glycosuria they find to be of serious import in India.

The effect of protein in the production of blood-sugar has been studied by Jacobsen and Edwards,²⁷ who find that after a standard meal containing 50 grms. of protein the blood-sugar of normal persons remains unaltered, while a typical curve of hyperglycæmia follows this in cases of severe diabetes.

TREATMENT.—In the treatment of diabetes mellitus, various forms of **Diet Restriction** (see MEDICAL ANNUAL, 1920, p. 90, and 1919, p. 122) are still in vogue; but there has been considerable criticism of the rigid fasting method which has been on trial for the past four years, as unsuited for many cases. Strouse²⁸ points out that the individual with a large reserve of fat offers an entirely different therapeutic problem from the thin nervous woman with tachycardia or the older person with arteriosclerosis and albuminuria. Allen and others,²⁹ as the result largely of experiments, conclude that in most cases life, strength, and assimilation can be preserved for a much longer time by a degree of undernutrition suited to the severity of the diabetes, and accomplished by the **Limitation of Fat** in the diet; but in more severe cases glycosuria can only be abolished by a degree of undernutrition which entails final death from inanition. In the most severe cases, therefore, fasting must not be pushed too far, and the patient is best treated by being left with some glycosuria. Stark,³⁰ in a review of fifty cases treated by the method of rigid fasting, finds that intestinal derangements are liable to ensue from it, and that in general thin persons bear complete starvation better than the obese. Strauss³¹ also criticizes prolonged fasting adversely, though he recommends the value of an **Occasional Day of Abstinence** from everything save large quantities of fluid. Crauer³² records cases showing the beneficial results of proceeding on the line of first eliminating all fat, then reducing protein, and finally cutting down carbohydrates. Fenlon,³³ on the other hand, recommends diet reduction with retention of protein, the generally adopted method. Leyton³⁴ recommends **Alcohol** during the period of meagre diet, both because he found the body-weight better maintained when it was given, and because it renders the patient less irritable during starvation and more able to stand the treatment. Edgar³⁵ found that while all the cases in which he had employed fasting responded fairly well to the initial fast, subsequent periods of starvation were often very lowering and produced a progressive ketonuria. He characterizes it, therefore, as a dangerous method. He alleges that he has had favourable results with a **Serum** from rabbits in which some of the internal secretory glands had been stimulated to increased activity. Lauritzen³⁶ contends for the necessity of making an individualized dietary treatment; and, though in some cases he found the starvation treatment satisfactory, in general he preferred a **Strict Vegetable Diet** without starvation. This consists daily of 300 to 500 grms. of green vegetables (containing 2 to 5 per cent of carbohydrate), 60 to 75 grms. of butter, 200 grms. of bouillon, 150 grms. of cranberries, 1 egg, with tea, coffee, soda-water, and alcohol. This diet he continues for two to eight days at a time, and finds that under it glycosuria readily disappears. In diabetes where chronic disease of the pancreas is present, he recommends the regular use of **Pankreon**, 5 or 6 grms. daily, with intervals of a few weeks now and then.

Mosenthal and Wiener³⁷ give a useful set of dietetic tables for the ambulant treatment of diabetic cases after they have left hospital. These allow for a carbohydrate-free diet providing 1500 to 2000 calories, to which carbohydrates may be added according to the tolerance which the patient has been found to possess. As these tables are very simple and practical, one of them, called the *low-fat, starch-free diet*, is given below:—

BREAKFAST :—	Calories	500	750	1000	1250	1500	1750	2000
Black coffee or plain tea								
Eggs	1	1	1	2	2	2	2
Meat or fish	A	B	B	C	D	E	F
Butter, flat teaspoonful	none	1	1	2	2	3	3

DINNER :—

Clear meat broth								
Meat or fish ..	..	B	D	E	E	F	F	F
Vegetables, from list, heaped								
tablespoonful ..	..	4	4	5	6	6	6	6
Cheese, heaped tablespoonful	..	none	none	none	none	none	1	1
Olive oil, teaspoonful ..	..	none	none	2	2	2	3	3
Butter, flat teaspoonful ..	..	1	1	2	2	2	3	4
Black coffee or plain tea								

SUPPER :—

Clear meat broth								
Eggs .. ..	..	none	none	none	none	1	1	2
Meat or fish ..	..	B	D	E	E	F	F	F
Vegetables from list, heaped								
tablespoonful ..	..	4	4	5	5	6	6	6
Butter, flat teaspoonful ..	..	1	1	1	2	2	3	4
Black coffee or plain tea								

Among the vegetables which may be used are asparagus, Brussels sprouts, cabbage, cauliflower, celery, cucumber, leek, lettuce, spinach, string beans. The quantities of meat and fish, indicated by the letters in the table, which may be chosen according to taste, are given below as ounces, weighed raw :—

	A	B	C	D	E	F
Boiled chicken	2½	3	5½	6	7½	10
Corned beef	1	1½	2½	2½	2½	3½
Boiled mutton	1½	2	4	4½	5½	7
Lean steak	2	2½	4½	4½	5½	7½
Cod	3½	4½	8	8½	11	14
Flounder	4½	5½	10½	11	14	18
Haddock	4	4½	8½	9½	12	15½
Herring	1	1½	2½	2½	3	3½

Williamson³⁸ (whose casein, cream, and water diet is given in the *MEDICAL ANNUAL*, 1919, p. 122) recommends in place of it a **Diet of Eggs, Cream, and Water**, given as a modified starvation diet for a week at a time, and states that it usually checks glycosuria in four to seven days. It is prepared as follows: Beat up 3 eggs with 3 ounces cream and a little water; more water is then added till the mixture measures 4 pints. Of this the patient takes half a pint every two hours from 8 a.m. to 10 p.m. In addition, he has coffee or tea at 8 a.m. and 4 p.m., and also warm beef-tea (½ pint) at 12, 6, and 10 p.m.

With regard to **Opothorapy**, Vigevani³⁹ recommends, in cases associated with thyroid disturbance, Moebius's **Antithyroid Serum** in doses of 0.3, to 1 grm., and, in cases which are sometimes found with disorder of the pituitary gland, the regular daily administration hypodermically of **Pituitary Extract**. The latter especially he found useful in checking the excess of water and of sugar. Koopman⁴⁰ has made similar observations as to the value of pituitary extract in suitable cases; and he has noted further that patients suffering from this form of diabetes have a peculiar intolerance for protein foods.

The empirical use of a **Decoction of Eucalyptus** has been much practised in the Canary Islands for cases of diabetes, which, according to Perez,⁴¹ is very common in these islands. This writer states that its use is followed by marked benefit, at least of a temporary nature. The leaves of *E. diversicolor* were used for making the decoction. **Caramel** as a food in diabetes has been strongly advocated by Reimer.⁴² He recommends it especially in the diabetes of youth, given to the extent of 100 to 200 grms. daily, divided into four or

five portions and mixed with coffee or alcohol, other forms of carbohydrate being withheld during its administration.

In arriving at a final diet after observations on the amount of carbohydrate that may be allowed to the individual patient, Cammidge¹³ recommends that the patient's tolerance should be assumed to be about 20 per cent below that amount of carbohydrate food which is just enough to produce a trace of sugar in the urine or to give a rise in the blood-sugar above 0.14 per cent. The same writer⁴⁴ recommends a method of preparing **Sugar-free Vegetables** for the diabetic; by boiling such vegetables as carrot, beetroot, and artichoke for a quarter of an hour, and repeating twice with changes of water, the sugar may be entirely removed. The same result may be attained by extracting these vegetables in a finely shredded state at 60° C. for an hour, changing the water every ten or fifteen minutes. The vegetables are thus obtained sugar-free, and in a much more palatable condition; they may further be desiccated by the current of air from an electric fan, kept indefinitely, and when required for use soaked in water and re-heated.

In the *treatment of acidosis*, Stark¹⁵ advocates a diet of **Milk**, with **Oxygen Inhalations** freely given. Waters¹⁶, as well as several other writers, indicates that the old plan of giving alkalis has been generally abandoned; fat should be completely eliminated from the diet, and **Great Quantities of Liquid** should be given; further, carbohydrates in some palatable and easily assimilable form, such as fruit-juice or gruel, may be added, to the amount of 1 grm. per kilo of body-weight daily. Stillman¹⁷ divides cases of diabetes, from the point of view of acidosis, into four groups: (1) About 46 per cent of his cases showed no tendency to acidosis; (2) 32 per cent were admitted suffering from moderate acidosis that cleared up on starvation treatment; (3) 14 per cent had a constant tendency to acidosis on any but the most carefully chosen diet; (4) 6 per cent developed or remained in severe acidosis in spite of fasting, and the prolonged fasting had to be replaced by occasional hunger days. In the severest cases **Fluids** up to 5000 c.c. in twenty-four hours, **Coffee**, catharsis by **Calomel and Salts**, and the maintenance of a diet of **Eggs and Lean Meat** formed the treatment which proved successful.

In *diabetes combined with nephritis*, Allen and others¹⁸ recommend that treatment be begun with a salt-free, protein-free diet containing 50 grms. of carbohydrate and providing 1000 calories daily. This, in a case described, was given in the form of puddings or cookies; and later the diet was changed to one containing 30 grms. of protein and 40 grms. of carbohydrate (1300 calories) with 2 grms. of salt, on which the patient continued to subsist entirely well, and fit for light clerical occupation.

In 16 cases of *diabetes complicated by pulmonary tuberculosis*, Janney and Newell¹⁹ found that good results were obtained from judicious undernutrition combined with rest, so that in all but two cases the patient became and was maintained sugar-free. Fasting in such cases they consider ill-advised and likely to lead to a fatal issue.

REFERENCES.—¹*Jour. Exper. Med.* 1920, April, 381, and May, 555 and 575; ²*Acta Med. Scand.* 1920, March 6 (abstr. in *Jour. Amer. Med. Assoc.* 1920, May, 1494); ³*Arch. of Internal Med.* 1920, April, 405; ⁴*Policlinico*, 1920, April, 482; ⁵*Johns Hop. Hosp. Bull.* 1919, 37; ⁶*Arch. of Internal Med.* 1920, June, 648; ⁷*Ann. de Méd.* 1919, Aug., 204; ⁸*Presse méd.* 1920, July, 475; ⁹*Acta Med. Scand.* 1920, June, 381 (abstr. in *Jour. Amer. Med. Assoc.* 1920, July, 281); ¹⁰*Amer. Jour. Med. Sci.* 1919, Sept., 307; ¹¹*Bull. Soc. méd. Hôp.* 1919, Nov., 43; ¹²*Brit. Med. Jour.* 1920, ii, 191; ¹³*Arch. of Internal Med.* 1919, Nov., 523; ¹⁴*Jour. Amer. Med. Assoc.* 1920, ii, 214; ¹⁵*Deut. med. Woch.* 1920, May, 46; ¹⁶*Wien. klin. Woch.* 1919, Aug., 871; ¹⁷*Lancet*, 1920, i, 708; ¹⁸*Paris méd.* 1920, May, 372; ¹⁹*Presse méd.* 1920, Aug., 553; ²⁰*Amer. Jour. Med. Sci.* 1920, April, 577; ²¹*Nederl. Tijds. v. Geneesk.* 1920, Jan., 295; ²²*Jour. Amer. Med. Assoc.* 1919, ii, 1232; ²³*Boston Med. and Surg. Jour.* 1920, ii, 165; ²⁴*Diabetic Manual* (Joslin), 1918, 19;

²⁵N. Y. Med. Jour. 1919, ii, 374; ²⁶Ind. Med. Gaz. 1920, March, 101; ²⁷Amer. Jour. Med. Sci. 1920, June, 833; ²⁸Jour. Amer. Med. Assoc. 1920, ii, 97; ²⁹Monograph II Rockefeller Inst. Med. Res. 1919 (abstr. in Jour. Amer. Med. Assoc. 1920, Aug., 480); ³⁰N. Y. Med. Jour. 1919, 1010; ³¹Therap. d. Gegenw. 1920, 6; ³²U.S. Naval Med. Bull. 1920, July, 345; ³³Boston Med. and Surg. Jour. 1920, i, 168; ³⁴Lancet, 1920, i, 498; ³⁵N. Y. Med. Jour. 1920, i, 803; ³⁶Amer. Jour. Med. Sci. 1920, July, 79; ³⁷Ibid. 46; ³⁸Brit. Med. Jour. 1920, i, 399; ³⁹L'Ospedale Maggiore, 1920, June, 107; ⁴⁰Nederl. Tijds. v. Geneesk. 1919, Oct., 1071; ⁴¹Med. Press and Circ. 1920, i, 52; ⁴²Deut. Arch. f. klin. Med. 1920, May, 219; ⁴³Med. Press and Circ. 1919, ii, 403; ⁴⁴Lancet, 1919, ii, 1192; ⁴⁵N. Y. Med. Jour. 1920, May, 800; ⁴⁶Ind. Med. Gaz. 1920, Jan., 8; ⁴⁷Arch. of Internal Med. 1919, Oct., 445; ⁴⁸Jour. Amer. Med. Assoc. 1920, ii, 444; ⁴⁹Ibid. 153.

DIARRHŒA. (See INFANTILE DIARRHŒA AND VOMITING.)

Continuous Intravenous Infusion of Blood may be useful in uncontrollable diarrhœa (p. 12). See also Magnesium Sulphate (p. 14).

DIPHTHERIA.

J. D. Rolleston, M.D.

BACTERIOLOGY.—Costa, Troisier, and Dauvergne¹ describe the following method for differentiating true diphtheria bacilli from morphologically similar organisms. A Petri dish containing a special medium consisting of horse serum, glucose, and litmus is inoculated with the suspected diphtheritic material, and placed in the incubator. Twenty-four hours later, pinhead-sized discrete transparent diphtheria-bacillus colonies, red in the centre and pink at the periphery, appear on the surface of the medium, into which they sink like upholsterer's nails. Pseudo-diphtheria bacilli, on the other hand, appear more flattened out, opaque, and bluish or greyish in colour. Later the differences between the two organisms become more marked. The colonies of diphtheria bacilli become flattened and umbilicated, and their red colour becomes deeper, while the diphtheroid colonies are distinguished not only by the absence of red coloration, but also by their irregular form, softer inconsistency, and by the fact that their central portion is their most elevated point.

P. Hartley and C. J. Martin² studied the rate of disappearance of diphtheria bacilli from the throat under exceptionally favourable circumstances, namely, in soldiers in France in whom the treatment and methods of examination attained a degree of uniformity not likely to be met with in civil practice. The authors estimated that the average duration of stay in hospital in their series was forty-five days, twenty of which were taken up in procuring information regarding the absence of diphtheria bacilli in the throat. During this latter period the patient might be, and often was, fit to leave. If two successive negative examinations had been required instead of three, the duration of stay would have been reduced to thirty-four days, while if only one negative examination had been needed the period would have been further reduced to twenty-one days. This economy in respect of stay in hospital was associated with a diminution in accuracy, and the risk of discharging patients still harbouring bacilli was increased.

A. B. Wadsworth³ states that, out of 398 cultures from diphtheria convalescents and contact carriers examined in the Division of Laboratories and Research of the New York Department of Health, 357, or 89·7 per cent, were virulent. He concludes that the diphtheria bacillus in persons who have had diphtheria or have become carriers through contact retains its virulence for several months. Changes in virulence or changes in species take place so slowly, that the three months' period required before making the virulence test is a lenient and satisfactory one.

MORBID ANATOMY.—F. Nuzum⁴ found *eosinophilous myocarditis* in 7 out of 29 hearts of children who had died of diphtheria, the eosinophil cells being present in sections from various parts of the auricles, ventricles, and papil-

lary muscles. The cells were never found in the structures which make up the specific conducting system of the heart, viz., the sinus node, Tawara's node, the bundle of His, and the Purkinje fibres. The myocardial changes characteristic of diphtheria did not differ from those in cases in which no eosinophils were found. The eosinophilia did not appear to have any relation to the severity of the clinical symptoms, to the degree of myocarditis, or to the amount of serum used. The condition was not found in the myocardium of patients who had died of various other diseases, including scarlet fever, meningitis, poliomyelitis, or measles. Nuzum regards eosinophilous myocarditis as the result of positive chemotaxis, some substance being present in the myocardium in response to which eosinophils migrate from the capillaries.

SYMPTOMS.—In an article on *wound diphtheria*, A. Weinert⁵ states that, though in many cases the diphtheria bacilli in the wounds are merely harmless saprophytes, in some cases they are extremely virulent. He alludes to Laewen and Reinhardt's case of a young doctor who infected himself while attending cases of wound diphtheria and in a few days succumbed to a severe attack of faucial diphtheria. The same fate befell Prof. Wilms, of Heidelberg, where there were numerous cases of wound diphtheria in the surgical clinic. Laewen and Reinhardt found that 10 per cent of patients with wound diphtheria had faucial diphtheria as well, and 15 per cent had diphtheria bacilli in their throat, figures closely corresponding with those of Weinert.

According to F. Göppert,⁶ the great majority of cases of *diphtheria of the umbilicus* occur at the end of the first week and in the second week of life. The disease may, however, develop much later when the infant is no longer in charge of a midwife or in a lying-in hospital. In such cases the child may be suffering from nasal diphtheria or be a diphtheria carrier, so that the infection may have been contracted in a lying-in hospital. In a large proportion of the cases there are hardly any symptoms beyond slight dampness of the navel, on examination of which a thin deposit will be found. In other cases, especially those in which the infection occurs within the first few days of life, the disease runs a much more malignant course. Ulceration of the umbilicus, with infiltration of the surrounding skin, and even gangrene, may develop. According to Göppert, most cases of diphtheria of the umbilicus occur in lying-in hospitals, though the infection may sometimes take place in private houses.

A. Leendertz⁷ records a case of *primary diphtheria of the vagina and skin of the natal cleft* in a girl, age 5½ years, who showed no evidence of faucial or nasal diphtheria. The truth of Trousseau's doctrine that paralysis begins in the region first attacked by diphtheria was well exemplified in this case. The first paralysis occurred in the bladder, as was shown by incontinence of urine, on the ninth day after the membrane had disappeared; and eighteen days after the paralysis of the bladder, or on the forty-eighth day of the disease, there was paralysis of the rectum. The following day paralysis of the palate set in, together with paralysis of the third and sixth cranial nerves, and ataxia of the legs. All the palsies gradually subsided. The origin of the paralysis of the bladder could be explained, as in the case of palatal palsy after faucial diphtheria, by a direct spread of the toxin. The subsequent palsies must be regarded as the result of circulating toxins, which may persist for a long time after an attack of diphtheria.

W. M. Marriott⁸ reports a case of post-diphtheritic paralysis of the respiratory muscles in a girl, age 10 years, whose life was saved by prolonged artificial respiration. An apparatus designed for administering artificial respiration to animals was used, and was kept up at intervals for five days, at the end of which time the respiratory muscles had so far regained their

function that artificial respiration was necessary only at relatively infrequent intervals. Complete recovery took place.

PROPHYLAXIS.—G. H. Weaver and J. T. Murchie⁹ made cultures of the hands of nurses and internes in a hospital for contagious diseases to find if they were free from organisms such as diphtheria bacilli and hæmolytic streptococci which they had acquired in handling patients. Their investigations showed that washing with soap and warm running water as ordinarily carried out did not entirely rid the hands of pathogenic bacteria. That it could be done, however, was indicated by the result of cultures from the hands of specially trained nurses. The writers conclude that detailed instructions should be given to all pupil nurses and internes in the care and cleansing of the hands, especially of the nails, when they begin work in a hospital for contagious diseases, special emphasis being laid on the great danger of the hands acting as carriers of infection to the patients and to themselves.

E. L. Bauer,¹⁰ who is in charge of Schick testing and active immunization for the Philadelphia Department of Health, has made observations on 3000 children, with the following results: Up to six months infants enjoyed immunity to diphtheria; from six months to three years 72.5 per cent gave a positive Schick reaction; from three to five years 46 per cent were positive; from five to ten years 32.4 per cent; from ten to twenty years 28.2 per cent; and over twenty years 13.2 per cent. Eleven hundred persons who were discovered to be susceptible to diphtheria by the Schick test were given **Toxin-antitoxin**; 200 of these were re-tested at the end of five months, and all gave a negative test. Bauer concludes that the proper way to meet the diphtheria problem is the universal injection of all babies under two years of age with toxin-antitoxin, the Schick testing and permanent immunization of all other pre-school-age children, and the Schick testing of all school children, with administration of toxin-antitoxin to those found to be susceptible. In adults, the groups that should be Schick tested are physicians, nurses, assistants, maids, and orderlies in all hospitals, all recruits in the army and navy, and attendants, nurses, and children in all children's institutions. Toxin-antitoxin should be administered to adults exposed to diphtheria, such as doctors, nurses, and other employees in a hospital for contagious diseases.

According to W. H. Park,¹¹ three injections of toxin-antitoxin give an immunity in 95 per cent of the cases, which develops between the fourth and twelfth week, and persists for at least three and a quarter years. The injections are absolutely harmless, 1950 babies from three to five days old having been injected without any ill effects. The older the child the greater is the reaction. The reaction is more severe in adults than in children, and is due to the presence of peptones and other foreign products in the broth, and not to the toxin-antitoxin itself. Bauer found that the reaction usually occurred after the first injection, and was milder or absent altogether after the second or third dose.

Other experiences of the Schick reaction and the use of toxin-antitoxin will be found in the papers of H. M. Leete¹² and T. E. Lilly.¹³

TREATMENT.—**Intramuscular Injection of antitoxin**, the advantages of which were illustrated some years ago by the reviewer (*see* MEDICAL ANNUAL, 1915, p. 220), has recently been recommended by Weil-Hallé.¹⁴ Armand-Delille,¹⁵ while agreeing that antitoxin is more rapidly absorbed by the intramuscular route, states that it is more rapidly eliminated than when it is given subcutaneously, and to remedy this he recommends a subcutaneous injection on the day following the intramuscular injection when the diagnosis has been confirmed bacteriologically. If necessary, a third may be given subcutaneously on the following day.

F. M. Wood¹⁶ states that a new method of treatment, consisting in the combination of a Vaccine composed of devitalized Klebs-Löffler bacilli with Antitoxin, has been employed during the last six years by the Chicago Department of Health. If the treatment can be administered before the disease has progressed more than four days and there is much toxæmia, the initial dose of the vaccine is 300 million bacilli. If the disease has lasted more than four days and there is much toxæmia, 100 million bacilli should be given, together with 3000 to 5000 units of antitoxin according to the severity of the case. The next dose may be increased to 300 million bacilli, and the following one to 500 million, and the antitoxin may be repeated as indicated. By this means both destruction of the bacilli and neutralization of the toxin are effected. The advantages of the method are, first, the saving in expense of the cost of the antitoxin, the patient producing his own antitoxin from the time the vaccine is administered; secondly, the limiting of epidemics owing to the prevention of carriers.

In discussing the treatment of *post-diphtheritic stenosis of the larynx or trachea*, Bardsley¹⁷ states that from five to fifteen months are required for progressive dilatation, and that any method will succeed if perseveringly applied. During the whole period of dilatation the tracheotomy tube has to be worn, as otherwise acute œdema is liable to develop.

Treatment of Carriers.—J. L. Brownlie¹⁸ treated 50 cases of 'positive throats' with Vaccine, in doses ranging from 10 to 200 millions, one to eight injections being given: 44 of the cases, which had received at most three doses, were discharged with two consecutive negative cultures on the eleventh day. The vaccine was made in the ordinary way, and was not autogenous. It was found that it produced well-defined degeneracy in the morphological appearance of the cultured organism, followed by its complete dispersal from the locality invaded. No bad effects were observed from the use of the vaccine. Brownlie calculates that the residence of the carrier in hospital is four weeks longer than that of the non-carrier, the former costing the chargeable authority thirty-five shillings more than the latter in food alone. Vaccine treatment of the throat in diphtheria is thus of considerable value when judged by a money-saving standard.

Graham Brown and E. Kent Hughes¹⁹ state that during 1919 over 100 Tonsillectomies were performed upon persistent carriers at the Brisbane Children's Hospital, and on an average ten days after operation three negative throat cultures were obtained. In all cases the tonsils were enucleated by the Sluder method, Heath's tonsillotome being used. The nasopharynx was also cleared by an adenotome, followed by a simple curettage and scraping with the finger-nail. Ethyl chloride anæsthesia was used in all the operations.

REFERENCES.—¹N. Y. Med. Jour. 1920, i, 651; ²Brit. Med. Jour. 1920, i, 796; ³Jour. Amer. Med. Assoc. 1920, i, 1633; ⁴Ibid. 1919, ii, 1925; ⁵Munch. med. Woch. 1919, 1477; ⁶Deut. med. Woch. 1920, 324; ⁷Med. Klinik, 1920, 151; ⁸Jour. Amer. Med. Assoc. 1920, ii, 668; ⁹Ibid. 1919, ii, 1921; ¹⁰Therap. Gazette, 1920, 457; ¹¹Med. Record, 1919, ii, 900; ¹²Lancet, 1920, i, 192; ¹³Boston Med. and Surg. Jour. 1920, i, 110; ¹⁴Bull. Soc. méd. Hôp. de Paris, 1920, 83; ¹⁵Ibid. 380; ¹⁶N. Y. Med. Jour. 1920, i, 53; ¹⁷Jour. Amer. Med. Assoc. 1920, i, 750; ¹⁸Lancet, 1920, i, 706; ¹⁹Med. Jour. of Australia, 1920, i, 361.

O. C. Gruner, M.D.

Rapid Bacteriological Diagnosis.—Debré and Letulle¹ consider all the fallacies of bacteriological diagnosis, and arrive at the following method: Incubate the swab on Löffler serum for twenty hours, and stain preparations (1) with Gram—no counterstain, (2) with Neisser (methylene blue 1, 95 per cent alcohol 20, distilled water 950, pure acetic acid 50; second solution, 0.2 per cent vesuvium in water; the first solution is applied twice, heating till steam rises each time;

the second solution is applied for ten seconds after a brief wash). They find that under these conditions granules appear only in true diphtheria bacilli. The only exception is the *Bacterium cutis commune*, which, however, ferments saccharose vigorously, and is also very rare in the pharynx. "No granules, no diphtheria."

REFERENCE.—¹*Presse méd.* 1919, Sept. 11, 515.

DISSEMINATED SCLEROSIS. (See SCLEROSIS, MULTIPLE.)

DIVERTICULITIS. (See INTESTINES, SURGERY OF.)

DUCTLESS GLANDS, CLINICAL PATHOLOGY OF. O. C. Gruner, M.D.

Adrenal.—Cramer¹ brings out the conception that the thyroid and adrenal glands form a humoral apparatus for the heat regulation of the body. The mechanism is as follows: The thyroid hormone stimulates the adrenal to form more adrenalin; the result is (1) that glycogen is discharged from the liver, thus causing increased metabolism, and consequently increased heat production; (2) that the arterioles contract and thus diminish the heat loss. His work is histological, using a special reaction. Whenever the gland is actively secreting, the vessels of the zona reticularis are congested. Infections, anaesthesia, acidosis, and hæmorrhage affect this gland. Agnel² finds that enteric, dysentery, malaria, tuberculosis, alcoholism, and antityphoid vaccination affect the adrenal. Loeper³ finds that there is a diminution of the HCl in the test-meal where the adrenal is interfered with.

Thyroid.—The assessment of the basal metabolism is the most striking addition to the scope of laboratory investigation. The most confident use of it emanates from the Mayo clinic. The second test is the sugar-tolerance test, which Lueders⁴ discusses. It enables the detection of border-line cases or early hyperthyroidism. Sajous⁵ looks for disease in the tonsils, sinuses, nose, nasopharynx, teeth, gums, stomach, etc., since cholin and neurin strongly excite the thyroid to activity sufficient to produce a thyrotoxicosis. Albeck⁶ finds a definite relation between the thyroid and the vomiting of pregnancy, in that in this ailment the thyroid is always small and hard. Hoshimoto⁷ has found that the thyroid has an action on the pancreas, and that in thyroid excess there may be steatorrhœa. Rohdenburg⁸ has found a family in which thyroid or adrenal administration was followed by marked temporary glycosuria. Kawamura^{9,10} has successfully transplanted the thyroid gland to another part of the same animal's body, and also to another animal. The organ continued to functionate efficiently for several months.

Hypophysis.—Strauss¹¹ describes a case in which defect of this gland was associated with periodic attacks of copious nasal discharge. They were relieved by gland extract. Glycosuria and high blood-pressure may be looked for (Reichmann¹²). Abel and Kubota¹³ consider that histamine is an important active principle of this gland, though it is present in small amounts in all tissues.

Pluriglandular Syndromes.—Tuberculosis should be looked for (Mariotti¹⁴), and lues (Farmachidis¹⁵), besides inquiring into the special signs of affection of the several components of the endocrine system.

REFERENCES.—¹*Sixth Scientific Report, Imperial Cancer Research Fund*, 1919; ²*Thèse de Paris*, 1918-19, 143; ³*Leçons de Pathologie digestive*, 1919, 73-85; ⁴*Arch. of Internal Med.* 1919, 432; ⁵*Med. Record*, 1919, 536; ⁶*Ugeskr. f. Læger*, 1919, 1047, 1083; ⁷*Endocrinology*, 1920, April, 56; ⁸*Ibid.* 63; ⁹*Jour. of Exper. Med.* 1919, 45; ¹⁰*Surg. Gynecol. and Obst.* 1919, Nov., 375; ¹¹*Med. Record*, 1919, 463; ¹²*Deut. Arch. f. klin. Med.* 1919, 133; ¹³*Jour. Pharmacol. and Exper. Therap.* 1919, 243; ¹⁴*Riforma Med.* 1919, 590; ¹⁵*Ibid.* 829.

DUODENAL ULCER. (See GASTRIC AND DUODENAL ULCER; STOMACH, SURGERY OF.)

DYSENTERY, BACILLARY. (See also AMOEBIASIS.)

Sir Leonard Rogers, M.D., F.R.S.

ETIOLOGY.—L. S. Dudgeon, A. L. Urquhart, and W. R. Logan¹ have recorded an elaborate investigation of the rôle of the common house-fly as a carrier of dysentery in Mesopotamia, and remark that it should be the duty of the ward medical officers to select specimens from stools for bacteriological examination. There was a close relationship between the number of fly-traps and the incidence of dysentery cases. For examining flies for pathogenic bacilli, the authors found it best to emulsify the fly's faecal deposit in saline, and plate to ensure that the colonies were not overcrowded, by which means they obtained positive results in 79 out of 382 examined after feeding on material containing dysentery bacilli. In caught flies, natural infection with pseudo-dysentery bacilli occurred in 3 out of 1240, which was not a very small number when the total swarms were considered.

S. M. Ross and C. M. Peckham² found an enterococcus a factor in some types of dysentery, a nearly pure culture having been obtained from the stools of one case, while in others they could be found microscopically and isolated on culture. It was a Gram-positive organism growing like a streptococcus, but sometimes more closely resembling a pneumococcus morphologically, while it is highly resistant. In one fatal case agglutination was positive with the blood of the patient. The cases may simulate typhoid fever clinically.

W. C. Davidson³ records his investigation of bacillary dysentery in children in Baltimore and in Birmingham, Alabama, where he found many of the cases returned as ileocolitis or summer diarrhoea were true dysentery due to Flexner's bacillus. Clinically they nearly always showed mucus and often blood, so were easily recognizable clinically as dysentery, over 80 per cent of acute cases of ileocolitis being really dysentery. In 63 control simple diarrhoea cases and in 100 healthy children the dysentery bacilli were absent from the stools. The infection is transmitted through dirty hands and flies contaminating food. The agglutination reactions with the patients' serum and standard dysentery bacilli were of diagnostic value. *B. Morgan 1*, *B. Welchii*, *B. proteus*, and *Streptococcus faecalis* were not the cause of dysentery or diarrhoea.

G. C. Low⁴ records an interesting series of cases mistaken for dysentery, in which syphilis, malignant disease, tubercle, and various helminthic diseases had been overlooked.

P. Manson-Bahr⁵ deals with the complications of bacillary dysentery, and records 27 per cent of complicating arthritis after a particular antidysenteric serum, but none after other serums, indicating toxic proteins in the former serum. Iridocyclitis and parotitis were also seen complicating dysentery.

TREATMENT.—W. E. Waller⁶ records his experience of Antidysenteric Serum in Mesopotamia, based on a study of 341 cases, including 208 proved bacteriologically to be bacillary and 133 clinically so and free from *E. histolytica*. A careful analysis led him to the conclusion that in cases treated early by serum the acute stage is shorter, the tendency to chronicity less, and convalescence more satisfactory than in those treated later by serum or by other methods. Arthritis was present as a complication of the dysentery in 1.2 per cent. Serum sickness, in the form of rashes, fever, pains, etc., occurred in 56 per cent of the cases, including two of heat-stroke.

B. G. Klein⁷ writes of serum treatment at Rouen, where dysentery bacilli were recovered from the stools in 412 cases, while 561 further negative ones showed typical symptoms of the bacillary disease, and absence of dysenteric

amœbæ. The serum was given intravenously, diluted with twice its bulk of normal saline, from 25- to 50- and even 100-c.c. doses being used. It is most effective in the first five or six days, but up to the ninth day it may cut short the disease or produce more complete recovery; it is practically useless later in the disease. Arthritic complications of dysentery occurred in 1 per cent of the cases.

P. Nolf⁸ reports good results by vaccinothrapy in both acute and chronic dysentery due to the Flexner bacillus. One-half of the cases were of the choleraic type, in which 1 to 2 litres of Normal Saline subcutaneously was very efficacious. Serothrapy failed in his hands, but Autogenous Vaccines in doses gradually increased from 10,000 to 5 to 10 billion subcutaneously, gave good results in all classes of cases. Later he used vaccines intravenously in doses of 10,000 gradually increased to 100,000 and given every fourth day. In 52 cases so treated only 2 deaths occurred, and all except 2, who left his care too soon, were completely cured within a few weeks, although he could not follow up the after-results.

E. Escomel⁹ has obtained good results by three enemas daily composed of 15 to 20 drops of Oil of Turpentine with the yolk of one egg in 60 c.c. of distilled water, together with 5 to 20 drops of Laudanum according to age. Bismuth Salicylate and Camphorated Tincture of Opium were also given by the mouth.

REFERENCES.—¹*Brit. Med. Jour.* 1919, ii, 471; ²*Lancet*, 1920, 1362; ³*Johns Hop. Hosp. Rep.* 1920, 225; ⁴*Brit. Med. Jour.* 1920, i, 255; ⁵*Ibid.* 791; ⁶*Lancet*, 1919, ii, 778; ⁷*Ibid.* 776; ⁸*Jour. Amer. Med. Assoc.* 1919, Oct. 18, 1177; ⁹*Ibid.* 1920, March 13, 769.

DYSMENORRŒA. Benzyl Benzoate employed in (p. 6); Ovarian Residue (p. 16).

DYSPEPSIA, ACID. Colloidal Bismuth recommended for (p. 10).

EAR DISEASE, INTRACRANIAL COMPLICATIONS OF. (See also CRANIAL SURGERY.)

John S. Fraser, M.B., F.R.C.S.

H. Mygind¹ has analyzed all his cases of intracranial otogenous disease during the last fifteen years. The four chief intracranial sequels to ear disease were meningitis (141 cases), sinus phlebitis (106), brain abscess (42), and subdural abscess (19 cases). In 65 per cent of the total only one intracranial complication occurred, and in the remaining 35 per cent two or more were found. Recovery took place in 36 per cent of all the intracranial cases, and in 45 per cent of those with only one complication. In this latter category the recoveries from meningitis were 18 per cent, and from sinus phlebitis 79 per cent. Age: About one-third of all the cases were children between 5 and 14 years; the proportion of recoveries at this age was 44 per cent for all cases of multiple intracranial disease, whereas for all ages the recoveries were only 19 per cent. Sex: This played no part, with the exception that between the age of 5 and 14 there were many more girls than boys. Side: Although many writers have maintained that middle-ear suppuration on the right side gives rise to intracranial sequels more frequently than when the left ear is affected, the author could not confirm this. There were, however, 27 abscesses in the right side of the brain, as compared with only 14 in the left.

MENINGITIS.

Lavage of Meningeal Spaces in Meningitis.—Bellin, Aloin, and Vernet² record a case of meningitis secondary to mastoiditis, in which they washed out the meninges. Lumbar puncture showed clear fluid containing streptococci. The lateral ventricle was tapped. In view of the bad prognosis it was

decided to wash through the meninges, and accordingly some serum coloured with methylene blue was injected through the lumbar needle. In a few moments the blue fluid appeared through the needle in the ventricle. There was slight dyspnoea at this point, which, however, did not last long. The washing was continued a few minutes, and the wound closed. There was considerable improvement in every respect for about four days, and the cerebrospinal fluid showed no streptococci. However, the symptoms later reappeared. Lavage was again carried out, but without much improvement, and the patient died.

The point at which the brain is tapped is 3 cm. above the external auditory meatus and mid-way along a line joining the nasion and the inion. A small trephine opening is made at this point, and a needle with an obturator is pushed in at right angles to the brain to a distance of 3 to 4 cm. As soon as the ventricle is reached a flow of liquid will occur when the obturator is withdrawn. Lumbar puncture is next performed, and a quantity of serum coloured with methylene blue is introduced, preferably through the lumbar needle.

SINUS THROMBOSIS.

Location of the Lateral Sinus.—Prentiss³ draws attention to the relation between the position of the lateral sinus and the curve of the supramastoid crest (posterior or third root of the zygoma). A very obliquely placed crest indicates that the sinus is well posterior to the field of approach to the antrum, and a horizontally placed crest indicates that the sinus is close to the field of operation. Further, the supramastoid crest is a guide to the upper border of the petrous. If the crest runs backward well above the external auditory canal, the cone of approach to the antrum may be made with little likelihood of exposing the meninges. On the other hand, if the crest runs backward just tangent to the canal, the approach must be made well below the crest.

Conservative Surgery of the Lateral Sinus.—C. C. Jones⁴ comes to the following conclusions: (1) In cases of mastoiditis, where the temperature is high, the sinus should be exposed. (2) The mortality following sinus operation is as great where there is routine ligation of the jugular as it is where the ligation is reserved for the severe cases. (3) The sinus should always be exposed before ligation of the jugular. (4) Ligation and resection of the jugular vein in thrombosis of the lateral sinus should be used only in those cases where there is undoubted evidence of septicæmia or a thrombosis of the vein itself. (5) With absence of such signs the thrombus should be removed, and we should await developments before ligating or resecting the jugular. (6) The consensus of opinion among otologists is that in thrombosis of the lateral sinus the proper treatment is ligation of the jugular vein. Jones, however, holds that thrombosis of the sinus is nature's way of ligating. All that is necessary in the majority of such cases is to open the sinus and remove the thrombus.

Blood Cultures in Sinus Thrombosis.—Kopetzky⁵ records four cases of thrombosis of the sigmoid sinus, and remarks that, when the temperature does not promptly drop after operation, continued efforts must be made to locate the infecting foci. The apparent well-being of the patient should not be permitted to mislead. Too much reliance must not be placed on negative blood-cultures. Failure to find streptococci in the blood-stream of a suspected case of thrombosis should never be made the determining factor to bar surgical intervention. In sinus cases complicated by meningitis, once the thrombus is removed, the septic type of temperature curve gives place to the high, level-ranged temperature of meningitis.

Gas-embolism of the Lateral Sinus after a Mastoid Operation.—Baraud⁶ states that we no longer regard pulsations of the lateral sinus as indicative of throm-

bosis. Either a healthy or a thrombosed sinus may pulsate or not pulsate. The pulsation of the sinus—healthy or otherwise—is not due to communicated cerebral pulsation; it is not synchronous with either pulse or respiration. It is due to the resultant of two forces of negative aspiration, one being the negative pressure in the right auricle, and the other the negative pressure of the thorax on inspiration, and the point which Baraud seeks to emphasize is that these two forces are both obviously more potent if the lateral sinus be closed off above. Hence the old idea that pulsation signified thrombosis, and was communicated from the underlying brain. In Baraud's case the sinus had been deliberately exposed in the course of evacuating an extradural abscess. At the moment when the bleeding occurred the wound was being dressed, with the patient in the sitting position. Baraud instinctively closed the bleeding point with his finger, but the patient took a deep breath, and fell to the floor. The finger naturally slipped from the sinus, but the latter ceased to bleed. Almost immediately bleeding recommenced, accompanied by stertor, cyanosis, dyspnoea, and audible pulmonary (*sic*) gurgling. The patient recovered. The probability is that the fall from the sitting position (by allowing blood to regurgitate up along the jugular and expel much of the air) was instrumental in saving his life.

Primary Thrombosis of the Superior Petrosal Sinus.—Mueller⁷ states that the occurrence of an eruption like chicken-pox in a case of otitis media should suggest the presence of bacteraemia. If septic temperature and rigors are present, and if the condition of the sigmoid sinus and jugular vein does not account for these symptoms, we must think of the possibility of thrombosis of the superior petrosal sinus resulting from extradural abscess in the middle fossa.

OTITIC BRAIN ABSCESS.

PATHOLOGY.—Casamajor⁸ states that brain abscess may occur in one of three ways: (1) Direct extension through the roof of the tympanum, the dura, and the pia mater, causing localized meningitis with cortical or subcortical abscess; (2) Indirect extension with little or no involvement of the meninges—these abscesses may lie very deep in the brain substance, and here probably the avenue of infection is by the Virchow-Robin lymph spaces in the vessel walls; (3) Metastatic abscess as a part of general septicæmia.

SYMPTOMATOLOGY.—(1) *The initial stage.*—This may be entirely lacking. When present, fever may or may not be found. The cerebral signs most commonly seen are headache, vomiting, and clouding of consciousness. The headache is usually general, but may be limited to the side of the lesion. Vomiting is more common in cerebellar than in cerebral abscesses. This initial stage usually lasts from twelve to twenty hours, but may extend over a week. (2) *The latent stage* may be entirely lacking, or it may last a few days, a few weeks, or over a year. During this period the symptoms of the initial stage more or less completely disappear, and the patient appears to have recovered. (3) *The manifest stage* comes on as a rule slowly, but sometimes with startling suddenness. There are: (a) General symptoms due to the disease and brain pressure from the abscess and surrounding œdema; and (b) Local symptoms due to destruction of, and pressure on, structures in the immediate neighbourhood of the abscess.

1. *General Symptoms.*—The temperature may be subnormal throughout, but in some cases high temperature, with chills, may be observed in the evening. When an abscess breaks through into the meninges or the ventricles, continued high fever is the rule. Headache is a constant symptom, generally over the entire half of the head. Some patients localize the pain over the site of the

abscess. In cerebellar abscess the pain may be felt most severely over the forehead. The position of the headache, even when the skull in this region is tender to percussion, cannot be relied on as a localizing sign. Vomiting, of the projectile type, is a common symptom, especially in cerebellar abscess. Slowing of the pulse-rate is a valuable diagnostic sign; not infrequently we see a similar slowing of the respiratory rate. Choked disc is found in only 33 per cent of all abscesses. Okada claims that optic neuritis without papillœdema is much more common. Convulsive phenomena, either general, hemi-, or local, occur with many large abscesses. The consciousness is always disturbed in varying degrees, from slight drowsiness with confusion to absolute coma or delirium.

2. *Local Symptoms.*—In *temporosphenoidal cases*, abscesses of considerable size may develop on the right side in right-handed patients without any localizing signs. When deep enough to impair the optic radiation fibres, left homonymous hemianopsia results, but the mental condition may prevent discovery. Bowers records a case in which the patient's disposition entirely changed; and from being a quiet fellow he had become uncontrollable. In left-sided abscesses disturbances in the speech mechanism are the rule. Complete sensory aphasia is practically never seen. The usual difficulty is paraphasia, inability to remember words they wish to use, and more or less disturbance in the understanding of speech. Pure hearing disturbances of subjective or objective nature are practically never observed. Willebrand⁹ has found paresis of the third nerve to be an early sign of abscess of the temporosphenoidal lobe. Paralysis of the sphincter of the iris or of the levator palpebræ superioris appears first. Later on the branches of the other external muscles supplied by the third nerve may be paralyzed. The author calls attention to the importance of paralysis of the sphincter of the pupil (i.e., dilated pupil on the side of the lesion), because this can be observed even when the patient is comatose.

In *cerebellar abscess*, Casamajor⁸ states that the patient generally lies with his head turned towards the side of the lesion. Often there is considerable rigidity of the neck. When he sits up in bed he complains of dizziness. When erect, he stands on a wide base, and in walking is unsteady and tends to fall away from the side of the abscess, but may fall the other way. When he raises both hands in the position of taking an oath he is unable to hold them there, and both drop suddenly, the one on the side of the lesion oscillating considerably as it falls. Cerebellar seizures are by no means constant. Nystagmus usually is toward the side of the abscess. As the muscular control of the cerebellum is homolateral, cerebellar signs are seen on the same side as the lesion. All movements of the homolateral limb are asynergic. The patient past-points usually towards the diseased side. Adiadokokinesis is generally present.

TREATMENT.—According to McCoy,¹⁰ the methods employed at present for protecting the meninges are mainly two: (1) MacEwen's, i.e., packing a layer of gauze all around the margins of the dural exposure, between the bone and the dura; (2) The cofferdam dressing—the dura is incised and iodoform gauze packed beneath the dural flaps. McCoy experimented on dogs. Thus far, subdural injections of paraffin appear to give a better type of adhesions than gauze pressure, because they are more accurate. Such injections do not seem to produce cerebral irritation.

Sharpe¹¹ holds that if we are absolutely certain that the abscess formation lies directly beneath the affected dura, and that this area of the dura is adherent to the underlying cerebral cortex, then the ideal method of operative drainage is naturally through the site of original infection. In a large per-

centage of patients, however, the local operation does not disclose any definite signs of a subdural lesion, and the dura is not adherent to the underlying cerebral cortex. In such cases it is distinctly dangerous to open or to puncture the dura and to explore in the hope that the abscess can be successfully drained. In these patients exploration of the temporosphenoidal lobe should be made through the 'clean' subtemporal route, as in the operation of subtemporal decompression and drainage. The vertical incision should be used. If the abscess is not found, then the exploration has been performed with little or no danger of meningitis or encephalitis. As an efficient means of drainage, Sharpe recommends the double glass tubes, one tube within the other, so that the outer tube always remains in place in the abscess cavity, while the inner tube can be removed and used as a means of suction-drainage. Sharpe advises a similar procedure in the case of cerebellar abscess. The mortality of brain abscess is high—without operation practically 100 per cent, and with operation 60 per cent and even higher. The diagnosis and accurate localization are most difficult, and for these reasons the operation of drainage must almost always be considered as an exploratory procedure.

Respiratory Paralysis in Brain Abscess.—Borries¹² records the case of a woman who was admitted to hospital with brain symptoms. While lumbar puncture was being carried out, the respiration suddenly ceased and the patient became cyanosed. Artificial respiration was begun, the operation wound opened up, and a large brain abscess evacuated. Spontaneous respiration soon recommenced, but the patient died next day. The author remarks that respiratory paralysis in these cases is due most probably to the increased intracranial pressure. In the present case the paralysis during lumbar puncture was probably due to the diminished pressure in the spinal canal causing blockage (corking) of the foramen magnum, and the onset of a vicious circle. In some cases of brain abscess the respiratory failure occurs slowly, and in others suddenly. As a rule respiratory failure is associated with abscess or tumours of the cerebellum. Borries suggests that the Trendelenburg position may be of value in the treatment of these cases (in addition, of course, to artificial respiration and evacuation of the abscess) because it has a beneficial effect on the sinking down of the brain-stem into the foramen magnum.

Cerebellar Abscess with Complete Homolateral Hemiparesis.—R. Damade and J. Boissier-Lacroix¹³ quote Professor Sabrazès's statement that cerebellar abscesses cannot be recognized clinically owing to the absence of any characteristic symptom. Giraud has shown that there may be complete destruction of a large part of the cerebellum without any so-called cerebellar symptoms. In the fatal case reported by the present writers there was complete hemiparesis on the same side (right) as the ear affection. This was the only sign which suggested a cerebellar abscess. Post mortem the abscess was found in the most anterior part of the right cerebellar hemisphere. According to Acland and Ballance, complete homolateral hemiparesis is pathognomonic of cerebellar abscess, and appears to be due to compression of the pyramidal tract below the decussation of the pyramids. Hemiparesis on the opposite side to the cerebellar lesion is caused by compression of the pyramidal tract above the decussation. The occurrence of hemiparesis in cerebellar abscess is not frequent. Only 30 cases were collected by Acland and Ballance in 1894, in 25 of which the hemiparesis was on the opposite side to the otitis, and in 5 on the same side. In the recent literature, the present writers have found only 2 cases of cerebellar abscess or tumour accompanied by hemiparesis on the side of the lesion.

REFERENCES.—¹*Ugeskr. f. Læger*, 1920, May 27 and June 3; ²*Lyon chir.* 1918, July-August, 455; ³*Ann. of Otol. Rhinol. and Laryngol.* 1918, xxvii, 116; ⁴*Ibid.* 1919, xxvii.

1164; ³*Laryngoscope*, 1919, Dec., 679; ⁶*Rev. de Laryngol. d'Otol. et de Rhinol.* 1919, Aug. 21; ⁷*Zeits. f. Ohrenheilk.* 1920, lxxix, 221; ⁸*Laryngoscope*, 1920, xxx, 436; ⁹*Zeits. f. Ohrenheilk.* 1920, lxxix, 28; ¹⁰*Laryngoscope*, 1920, xxx, 75; ¹¹*Ibid.* 376; ¹²*Ugeskr. f. Læger*, 1919, 325; ¹³*Gaz. hebdom. des Sci. méd. de Bordeaux*, 1919, Dec. 7.

EAR, EXTERNAL, AFFECTIONS OF.

John S. Fraser, M.B., F.R.C.S.

Carcinoma of the External Ear.—During the past two years Sutton¹ has had 17 cases of carcinoma of the ear. All the patients were men. The youngest was 28, the oldest 81. In five cases the growths were of the basal-cell type. In thirteen the carcinomata had developed from seborrhœic keratoses. Eleven of the patients had suffered from frost-bite. All the lesions developed above the level of the floor of the external auditory meatus. The upper portion of the helix was a favourite site. There was a striking similarity in the case-histories. Following a slight injury the patient developed a small, superficial ulcer, which healed very slowly. If the scab was not deliberately scratched, it was accidentally rubbed off by the use of a rough towel. Finally, the lesion apparently healed, but a small keratosis developed. The symptoms were at first slight, and consisted of itching and burning. Later the patients complained of throbbing, penetrating pain, which often involved the entire side of the head, and was only relieved by narcotics.

TREATMENT.—In growths of the prickle-cell type, early and radical excision is the best and safest course. The basal-cell tumours are less serious. As a prophylactic measure, the ears should be suitably protected from cold during the severe winter months. Even slight lacerated wounds of the ear should receive proper surgical attention. The edges should be pared down and carefully approximated, and the wound properly closed and dressed. Seborrhœic keratoses can sometimes be successfully combated by the daily use of *Salicylic Acid Ointment* (10 per cent). *Carbon-dioxide Snow* is a valuable remedy, but the *Actual Cautery* is a much better agent in these intermediary cases. Unfortunately the tissues in this vicinity do not heal very promptly following actual cauterization, and the burns are frequently a source of extreme discomfort. Of the various chemical caustics, *Arsenious Oxide* is probably the best, but it is open to the same objection as the actual cautery. Prior to the involvement of the cartilage, many of the cases respond very satisfactorily to *Röntgen-ray* treatment. Only the intensive method should be used. In the treatment of basal-cell carcinoma by *Radium*, a severe reaction is seldom necessary, and in the superficial cases should always be avoided. The healing process after radium treatment can sometimes be expedited by the cautious use of *Liquor Hydrargyri Nitratis*. This is applied by means of a tooth-pick, and its action promptly halted at the end of one or two minutes by a liberal coating of *Sodium Bicarbonate*. In cases presenting cartilaginous involvement, Sutton has found both radium and *Röntgen-ray* treatment useless. Prompt **Excision** is the best and safest plan. As a rule the ensuing deformity is comparatively slight.

Otomycosis.—Cheatle² states that at rare intervals cases of aspergillus infection of the external meatus are seen in private practice, but during nine months he has met with seven—a remarkable increase. In all of these one ear only was affected, and the trouble involved the deep meatus. Cheatle is driven to the conclusion that bath-water is the only likely means whereby the fungus could gain entrance to the ear, and as a sidelight on this theory it is his experience that otomycosis is much more frequent in private than in hospital practice. In one case Cheatle obtained a sample of water from the bath cistern, and got the following report: "The water contained a good deal of deposit, various forms of animal life, rotifers, etc. The chief component of the material was a fungus. Cultures showed numerous black fructifications

closely similar to those seen in the material from the ear. The organism was undoubtedly an *aspergillus*". The increase in the number of cases may be due to neglect to clean out the cisterns owing to the war. The cases quickly got well under cleansing and *Perchloride of Mercury* and *Spirit Instillations*.

Earache due to Larvæ in the External Auditory Meatus.—Alderson³ records the case of a gardener who complained of violent pain in the right ear. There was a discharge of blood from the canal. Whilst trying to view the membrane, Alderson saw what looked like small worms passing across the field of vision, and with forceps succeeded in extracting three live maggots. A remaining maggot refused to be caught until stupefied by *Chloroform Vapour*. The patient was instantly relieved, and the next morning the canal and membrane looked perfectly healthy. Alderson learnt afterwards that during the previous week a fly had entered the patient's ear, and was only removed after several minutes.

Broom⁴ states that the spinose ear tick, which is a native of America, has been for some years introduced into South Africa. It is chiefly parasitic upon calves, sheep, and goats. When a tick enters the human ear, the patient at once realizes that there is something alive in his ear, and comes to a doctor with the diagnosis already made. There is usually little difficulty in seeing either the tick or some of its legs. Broom has never experienced any difficulty in catching the tick with forceps and removing it entire.

Syphilitic Papules on the Drumhead.—Moeller⁵ records the case of a male, age 21, suffering from syphilitic papules on the head, tonsils, and in the right external meatus. One of the papules had a definite stalk arising from the drumhead. Antisyphilitic treatment caused complete disappearance of the condition.

Stenosis of the External Auditory Meatus.—In the treatment of stenosis of the external meatus due to seborrhœic eczema, Plazotta⁶ recommends first of all that the canal should be dilated for two weeks with plugs of cotton-wool smeared with *Zinc and Sulphur Ointment*. He then inserts a laminaria tent, which remains in position for twenty-four hours. This treatment was successful in dilating the meatus to its normal diameter. In the later treatment of the case, he employed *Alcohol Drops*, strips of *Iodoform Gauze*, and insufflations of *Hot Air*. The treatment lasted two and a half months.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1920, Jan. 10, 88; ²*Jour. of Laryngol. Rhinol. and Otol.* 1920, xxxv, 33; ³*Brit. Med. Jour.* 1920, ii, 319; ⁴*Jour. of Laryngol. Rhinol. and Otol.* 1920, xxxv, 362; ⁵*Acta Oto-Laryngologica*, No. 1, 211; ⁶*Centralbl. f. Ohrenheilk.* 1920, xviii, 46.

EAR, INNER, AFFECTIONS OF.

John S. Fraser, M.B., F.R.C.S.

Meningitic Neurolabyrinthitis.—Fraser and Milne Dickie¹ come to the following conclusions: (1) Meningitic neurolabyrinthitis is a frequent cause of deafness and deaf-mutism. (2) Deafness due to epidemic cerebrospinal meningitis is certainly due to meningitic neurolabyrinthitis (*Plate XVI, Fig. A*). Measles and pneumonia may also be followed by meningitis and secondary neurolabyrinthitis (*Plate XVI, Fig. B*). In acquired syphilis and mumps, leptomeningitis is of common occurrence, and is associated with inner-ear deafness, which is probably to be explained by neuritis or neurolabyrinthitis. Certain cases of deafness after influenza and osteomyelitis may also be of meningitic origin. (3) The original source of infection may be in the respiratory tract, parotid gland, genital organs, long bones, or elsewhere. (4) A blood infection (septicæmia) probably in all cases forms the connecting link between the primary disease and the onset of meningitis. (5) Meningitic neurolabyrinthitis is usually, but by no means always, bilateral. The onset is usually sudden. Irritative symptoms,

such as tinnitus and giddiness, are often present, but may not be observed owing to the mental condition (coma) of the patient. (6) Deafness due to meningitic neurolabyrinthitis may be associated with other metastatic lesions—e.g., orchitis, arthritis, mastitis, blindness, or paralysis of the oculomotor nerves. (7) The infection usually passes along the subarachnoid space into the internal auditory meatus, and then along the nerves and vessels to the labyrinth. In some cases the perilymphatic aqueduct is the route of invasion, while in others both paths may be involved. (8) As a rule both the cochlear and vestibular apparatus are affected. Frequently the cochlear apparatus is the one mainly or alone involved; rarely do we have a more or less isolated affection of the vestibular apparatus. (9) The pathological changes producing the deafness may be: (a) hydrocephalus; (b) changes in the walls of the fourth ventricle; (c) purulent infiltration of the eighth nerve, with subsequent descending neuritis, accompanied by atrophy of the spiral ganglion and Corti's organ; (d) purulent labyrinthitis, which, if the patient lives long enough, is followed by the formation of granulation tissue and, later, of new connective tissue and bone in the hollow spaces of the labyrinth. (10) The resulting deafness is as a rule complete and permanent in the ear (or ears) affected. (11) Vestibular symptoms (loss of balancing, and waddling gait) pass off rapidly in adults, but in young children they may last as long as one year. (12) In cases of sudden nerve deafness, with or without vestibular symptoms, lumbar puncture should be performed and the cerebrospinal fluid examined chemically and microscopically. The Wassermann reaction of the fluid should also be tested and cultures made. (13) Repeated lumbar punctures are of use in treatment, especially in cases of deafness due to hydrocephalus. Small doses of potassium iodide and hypodermic injections of pilocarpine have been used in the treatment of meningitic neurolabyrinthitis, but apparently without success.

Diseases of the Ear in Typhoid Fever.—Lehmann² has observed 23 cases of deafness due to typhoid fever, and found that the trouble was of nervous origin due to toxæmia. The vestibular apparatus was not affected. Permanent injury to the cochlear nerve was rare.

Syphilitic Affection of Sixth and Eighth Nerves.—Hoshino and Shimasaki³ state that, although paralysis of the sixth cranial nerve associated with middle-ear disease is now well recognized, they have not been able to find a recorded case in which impaired hearing and tinnitus without otitis media followed paralysis of the abducens nerve. Their patient was a man, age 42, who denied syphilis. Vision was normal, and there were no changes in the fundus. Right abducens paralysis was present, but no other oculomotor nerve was involved. The patient had severe pain in the right temporal and mandibular regions, with deafness and intense tinnitus in the right ear. There was no fever or vertigo, and no facial paralysis. Functional tests revealed nerve deafness in the right ear, with normal vestibular reactions. A röntgenogram showed that the upper border of the right petrous pyramid did not appear as sharp as it did on the left side. The Wassermann reaction was triple positive. Antiluetic treatment resulted in prompt improvement. With regard to the site of the lesion, Hoshino and Shimasaki note that at the spot where the abducens nerve perforates the dura, just behind the tip of the petrous pyramid, the nervus trigeminus and acustico-facialis are closely related to it. The lesion in all probability was on the posterior surface of the petrous portion of the temporal bone.

Old-age Deafness.—Mayer⁴ points out that cases of deafness in old people should be divided into three groups: (1) Those due to causes other than old age—e.g., progressive labyrinthine deafness and focal disease of the labyrinth.

PLATE XVI.

MENINGITIC NEUROLABYRINTHITIS



Fig. A.—Case of epidemic cerebro-spinal meningitis associated with labyrinthitis. 1, Purulent exudate in helicotrema; 2, Exudate in scala vestibuli; 3, Same in scala tympani; 4, Cochlear nerve with hemorrhagic purulent exudate around; 5, Endosteum detached from wall of scala tympani of basal coil (artefact). ($\times 9$.)

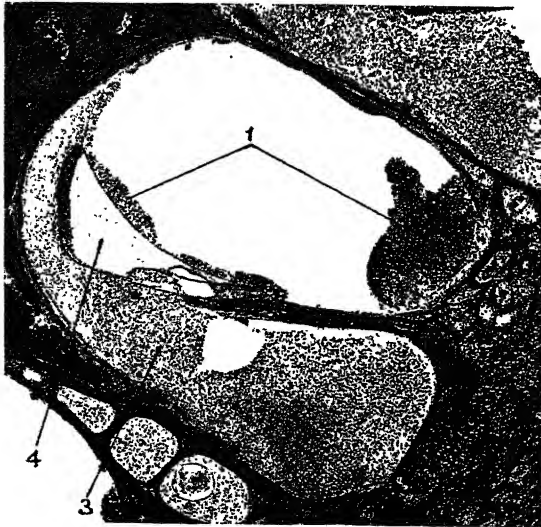


Fig. B.—Case of measles, pneumonia, and meningitic labyrinthitis. 1, Purulent exudate in scala vestibuli—to the left it is lying on upper surface of Reissner's membrane; 2, Spiral ganglion infiltrated with pus; 3, Scala tympani full of pus; 4, Cochlear canal with fibrinous and slightly purulent exudate. ($\times 88$.)

By kind permission of the Carnegie Trust

PLATE XVII.

TUMOURS OF EIGHTH CRANIAL NERVE



Horizontal section of right ear in a case of neurofibroma of the eighth nerve. 1, Head of stapes with scapula; 2, Facial nerve; 3, Posterior canal with hemorrhage in perilymph space; 4, Tumour; 5, Lower part of utricle; 6, Dilated internal meatus with tumour. ($\times 6$.)

MEDICAL ANNUAL, 1921

By kind permission of the Carnegie Trust

PLATE XVIII.

TUMOURS OF EIGHTH CRANIAL NERVE—*continued*



AXIAL SECTION THROUGH RIGHT COCHLEA FROM A CASE OF NEUROFIBROMA OF THE EIGHTH NERVE.
1, Dilated cochlear canal, basal coil; 2, Capsule of tumour; 3, Tumour tissue; 4, Cochlear nerve compressed by tumour tissue; 5, Central canal of nodulus. ($\times 17$.)

By kind permission of the Carnegie Trust

thine capsule (otosclerosis); (2) Those due to atheroma and marasmus, in which we find degenerative changes in the labyrinth and acoustic nerve; (3) Presbycusis, which occurs in all old people, and is, according to Mayer, caused by rigidity of the basilar membrane. Mayer has examined microscopically 26 cases, and finds this change more or less marked in all people over 60 years. Thickening and calcification of the basilar membrane is most marked in the intravestibular part of the cochlea where the membrane is very narrow, and diminishes as one passes up to the apex of the cochlea, where the membrane is broadest. This pathology of old-age deafness agrees with the results of clinical examination if we accept the Helmholtz theory of hearing, i.e., the (piano) theory of peripheral analysis. For example, in old age we find loss of the high tones, corresponding to the rigidity of the narrow part of the basilar membrane near the round window, whereas the low tones, which are supposed to be appreciated at the apex of the cochlea, are preserved.

Gildemeister² finds that the *upper tone limit* in young children is 20,000; at puberty it has sunk to 19,000; at 30 years to 15,000; and at 47 years to 13,000. Further, the upper tone limit is lower when the patient is tired. The intensity of the tone is important—i.e., while a certain high tone of feeble intensity may not be heard, increase in the intensity enables it to be heard.

Hysterical Deafness.—Hurst⁶ states that whenever hysterical deafness is associated with mutism it requires no special treatment, as hearing almost invariably returns spontaneously when speech is restored. In order to make this certain, it is advisable to let the patient know that directly he speaks he will hear his own voice and that then he will hear everything clearly. There is rarely any difficulty in curing the mutism by simple explanation and persuasion. Uncomplicated deafness is much more difficult to treat. Hurst found that hypnosis was never of any use, as the patient remained deaf while hypnotized, and consequently heard none of the suggestions which were made to him. In a number of cases he performed 'fake' operations; but the method was not invariably successful, and could not be regarded as desirable. During the past year Hurst has found that the vast majority of cases can be cured by the most rational form of psychotherapy—explanation with persuasion and re-education. The patient is made to understand by written explanations why he is deaf, and that the original cause of his deafness long ago disappeared: as at first the deafness was organic, he could not hear, however much he listened, and consequently after a time he ceased to listen at all. He is next persuaded to listen intently, and is taught that listening is just as active a process as moving, and requires a conscious effort on his part until it becomes automatic once more. Sounds are generally heard before words can be recognized, and a patient will hear a gramophone before he can recognize the tune. A word may have to be repeated several times before it is understood. Even when a man has completely recovered his hearing, it may take some time for him to become accustomed to the new conditions. When caught unawares he often fails to hear.

Vestibular Hysteria.—Lewkowicz⁷ states that the differential diagnosis between organic and hysterical affections of the vestibular apparatus is exceedingly difficult. Often we have to deal with a combination of hysteria and neurasthenia. Politzer holds that there is a neurasthenic form of Ménière's symptom-complex. The use of Bárány's method of testing the vestibular apparatus is of the greatest value, because in the absence of rotation and caloric reaction we can be sure that the condition is not due to hysteria.

Vestibular Vertigo of Non-suppurative Origin.—Kerrison⁸ states that vestibular vertigo of non-suppurative origin must be made to include any

disturbance of equilibrium the pathological sequence of which includes a disturbed vestibular balance. The search for an extra-aural focus of disease may lead to a gastro-intestinal infection, a diseased tonsil, an infected dental root, an abscess in the most distant part of the body, cerebrospinal syphilis, a nephritis, or any dyscrasia causing chemical changes in the blood, such as ptomaine poisoning. Any of these lesions, when they give rise to a disturbance of balance between the two static labyrinths, induce a vertigo of vestibular type. His conclusions are: Constant or semi-constant vertigo as a result of a functionally dead labyrinth is practically a clinical impossibility. Coincidence of a functionally inactive labyrinth and prolonged or persistent vertigo suggest, therefore, that either (a) the labyrinthine lesion is potentially active and progressive, or (b) the vertigo is intercurrent and to be otherwise accounted for. In vertigo of purely vestibular type, relief occurs in one of two ways; either (1) by restoration of normal nerve tone and function, or (2) by absolute nerve paralysis or destruction. The vestibular nerves are rather susceptible to toxic agents reaching the ears by the blood or lymph channels. Vertigo depending upon a vestibular nerve neuritis of recent development—the cochlear mechanism escaping injury—recovers quickly when the cause is removed. In vertigo depending upon a chronic non-suppurative lesion involving the static and auditory mechanism alike, the prognosis is exceedingly uncertain—i.e., the probability of recurrent attacks from slight causes is very considerable. Cases of vertigo beginning with a sudden onset give as a rule a distinctly more favourable prognosis than do the more indefinite types of gradual development. The clinical details of the nine cases recorded are well worth reading in the original.

Adrenalin in Vertigo.—Vernet⁹ points out that vertigo springs from an upset of the labyrinthine equilibrium, and is a labyrinthine vasomotor or toxic phenomenon. Adrenalin is capable of favourably modifying vertigo when the cause allows it. The vertiginous sensation is a phenomenon of labyrinthine irritation. In the treatment of vertigo Vernet does not approve of quinine, which injures the hearing, or of sedatives. He gives 5 to 20 drops of Adrenalin (1-1000) twice a day by the mouth, interrupting this treatment every ten days. Doses must be administered progressively. Vertigo generally disappears in a few days under this treatment.

Deafness and Tinnitus.—Passow¹⁰ strongly recommends diathermy and radium in the treatment of deafness and noises in the ear.

Ear Diseases and Lumbar Puncture.—Gunnar Holmgren¹¹ has observed three cases of nerve deafness caused by detonation. In all three lumbar puncture produced great improvement of the hearing. In one case the pointing test showed disturbance of the vestibular apparatus, and in this the deafness and the pointing error improved or became more marked together.

Tumours of the Eighth Nerve.—Fraser¹² states that the growth starts in the internal auditory meatus, and hopes that in future otologists may be able to diagnose acoustic tumours in the "early or otological" as opposed to the "late, neurological, or general surgical" stage.

ETIOLOGY.—(1) Neurofibroma of the eighth nerve is intimately related to general neurofibromatosis, which may be inherited and occur as a family disease (Alexis Thomson holds that neurofibromatosis dates from intra-uterine life). In support of this view, Feiling and Ward have recently published a paper on a "familial form of acoustic tumour". (2) Sickenmann and Nager believe that tumours of the eighth nerve are associated with intra-uterine meningitis. The symptoms of an acoustic tumour rarely occur before the third decade.

PATHOLOGY.—All observers are agreed that the tumours do not consist of

nerve fibrils. They are probably mixed tumours, gliofibromas composed of germinal tissue—i.e., they are tissue 'rests'. Solitary tumours of other cranial nerves are practically unknown, whereas Henschen has collected 130 cases of solitary tumour of the acoustic. He holds that between the branches of the eighth nerve in the internal meatus embryonic connective tissue is present, and that this explains why the eighth nerve is so often the seat of tumour. The eighth nerve consists of two parts: (1) a central non-medullated portion, and (2) a peripheral medullated portion. The junction of these two parts occurs just within the internal auditory meatus at its cranial end. Cushing believes, and Fraser agrees, that the tumours arise from tissue-rests near the transition zone. Changes in the labyrinth are present in these cases, and are illustrated in *Plates XVII, XVIII*.

FUNCTIONAL EXAMINATION OF THE EARS.—Cochlear Apparatus.—Although in the great majority of cases there is complete deafness in the affected ear, Sörgo states that the patient may in the early stages hear the conversation voice at 4 inches. If such cases be followed up, however, we eventually get complete deafness. The watch is not heard at all. Bone conduction is shortened on the affected mastoid, and is not influenced by closure of the external meatus (Neumann). Weber's test is lateralized to the good ear. Rinne's test is absolutely negative on the affected side. Rhese says that *nerve deafness with loss of the lower tones* is diagnostic of a lesion in the nerve-stem or in the central paths. The upper tones are also lost, and so we get concentric narrowing of the hearing field somewhat similar to the change in the visual field in cases of pressure on the optic chiasma by tumour of the hypophysis.

Vestibular Apparatus.—Spontaneous nystagmus is usually present to both sides, and may be increased by sudden movements of the head. It is usually most marked to the homolateral side. In fairly advanced cases there is as a rule spontaneous nystagmus on looking up, and even on looking down. The spontaneous nystagmus may change from time to time, as in cases of cerebellar abscess. During the giddy attacks external objects seem to rotate. The pointing reaction is usually normal. On Romberg's test the patient usually tends to fall to the side of the lesion, and to deviate to this side on walking. Most observers have found that rotation to that side which tests specially the healthy ear gives a longer 'after-nystagmus' than rotation in the other direction; we have, however, to meet the difficulty of estimating after-nystagmus in cases in which spontaneous nystagmus is present. The caloric test on the healthy side gives a normal result, or even produces an excessive reaction—the 'lasting nystagmus' of Neumann—which may continue for five minutes. (It is remarkable that there is no nausea or giddiness during this 'lasting nystagmus'.) On the other hand, there is no reaction on applying the caloric test to the affected ear. On using Ruttin's apparatus for the simultaneous cold caloric test of both labyrinths, we only get a reaction from the healthy ear. Syringing the healthy ear produces the usual pointing error, whereas syringing the affected ear has no result. There is diminution or loss of the galvanic reaction on the diseased side.

DIFFERENTIAL DIAGNOSIS.—If solitary tumours of the eighth nerve are to be diagnosed at the early stage, it is of the utmost importance that otologists should *thoroughly examine all cases of unilateral nerve deafness*. (1) Acquired syphilitic neurolabyrinthitis should be diagnosed by the history of syphilitic infection and the Wassermann reaction of the blood and cerebrospinal fluid. (2) Neuritis of the cochlear or vestibular (or both) divisions—due to (a) exposure to cold wind, (b) toxæmia in cases of pyorrhæa alveolaris, chronic tonsillitis, or appendicitis—can be eliminated by a careful history of the case and thorough physical examination. Such cases do not show complete deafness

and loss of the vestibular reaction. (3) Hæmorrhage into the labyrinth in the bleeding diseases should be excluded by an examination of the blood. (4) Senile or arteriosclerotic nerve deafness is bilateral, and, as a rule, is not accompanied by giddiness. The low tones are retained, along with the vestibular reactions. (5) Unilateral congenital deafness is rare, and is not associated with giddiness or nystagmus. In the writer's experience the vestibular reaction is present in such cases. (6) Circumscribed labyrinthitis and labyrinth fistula are of course associated with otitis media, and usually with cholesteatoma. (7) Recent diffuse labyrinthitis can be excluded by the history, and progress of the case. (8) Otosclerosis is occasionally associated with giddiness, but functional examination of the cochlear and vestibular apparatus should clear up any difficulty. (9) Serous meningitis in the lateral cistern (Bárány's symptom-complex) is as a rule associated with a history of otitis media and a well-marked pointing error not usually found in acoustic tumour. Lumbar puncture resulted in improvement in the cases reported by Bárány, and was followed by a return of normal caloric reaction.

TREATMENT.—See MEDICAL ANNUAL, 1916, page 109, and 1919, page 294.

Metastatic Carcinoma of the Ear.—Schlittler's¹³ case was that of a woman 43 years old. Functional examination showed severe *bilateral* nerve deafness. Autopsy revealed extensive metastases of carcinoma in the bones, whose point of origin, however, was not ascertained with certainty. Both temporal bones showed a carcinomatous infiltration of the acoustic and facial nerves, including their ganglia. Otosclerosis was present on both sides, but this the author regards as a coincidence. The pia-arachnoid was also the seat of cancerous metastases.

REFERENCES.—¹*Proc. Roy. Soc. Med.* 1920, xiii (Otol. Sect.), 23; ²*Arch. f. Ohrenheilk.* 1908, ciii, 99; ³*Ann. of Otol. Rhinol. and Laryngol.* 1919, xxviii, No. 2, 489; ⁴*Arch. f. Ohren-Nasen-Heilkopfkunde*, cv, 1; ⁵*Zeits. f. Sinnesphysiol.* 1, 1918; ⁶*Med. Press and Circ.* 1920, Jan. 7, 9; ⁷*Zeits. f. Ohrenheilk.* 1920, lxxix, 229; ⁸*Laryngoscope*, 1920, xxx, 626; ⁹*Presse méd.* 1920, July 10, 462; ¹⁰*Med. Klinik*, 1914, xvii, 752; ¹¹*Acta Oto-Laryngologica*, i, 294; ¹²*Proc. Roy. Soc. Med.* (Otol. Sect.), 1920, xiii, 109; ¹³*Arch. f. Ohrenheilk.* 1919, ciii, 121.

EAR, MIDDLE, DISEASE OF. (See OTITIS MEDIA.)

ECLAMPSIA. (See PREGNANCY, DISORDERS OF.)

ECZEMA. (See also SKIN, GENERAL THERAPEUTICS OF.)

E. Graham Little, M.D., F.R.C.P.

Hazen¹ analyzes 195 of his cases of 'eczema' as regards causation, which were studied by a competent internist, by a pædiatrician in the juvenile cases, and by free use of x-ray skiagrams of intestines and teeth. The following instructive list is compiled of the causes ascribed:—

Local irritation:—					
No. of Cases			No. of Cases		
Soap and water ..	..	36	Clothing ..	..	18
Weather ..	..	6	Plants ..	..	6
Occupation or chemicals ..	..	30			
					96
Local infection:—					
Bacterial ..	..	4	Epidermophyton ..	..	2
					6
Local predisposing causes:—					
Excessive sweating ..	..	16	Varicosities ..	..	5
Frostbite ..	..	1	Xerodermia ..	..	3
					25

Internal causes :—				
Disturbed vegetative nervous system	..	..	..	14
Urticaria	..	..	..	7
Combined causes				9
Undetermined causes				26
Disturbed food assimilation, eczema of children				12
				33

In a certain number of cases the eruption is due to direct infection of the skin by micro-organisms, especially the staphylococcus.

Gardiner,² following Arthur Hall, is inclined to ascribe the prevalence of eczema in young children to the special vulnerability of the infantile skin to changes of temperature, to irritating clothing, to the over-use of alkaline soaps, and to ill adaptation of the child to changes of diet. He has investigated the claim that acidosis is a frequent cause, and regards this as unproved (*see SKIN DISEASES, MISCELLANEOUS—ACIDOSIS IN*). He advocates complete prohibition of soap; baths of tepid, not hot, water; coverings to be as loose and easy as possible. Fresh air, sunshine, and avoidance of heated atmospheres are important adjuvants to treatment. Early treatment is desirable, and the following ointment is recommended :—

R	Sulphuris Præcipitati		Zinci Oxidi	ʒij
	Acidi Salicylici	āā gr. ij-v	Vaselinum	ad ʒj
	Pulveris Amyli	ʒij		

Or,

R	Sulphuris Præcipitati		Vaselinum	ad ʒj
	Acidi Salicylici	āā gr. ij-v		

These should be rubbed in twice or thrice daily, and spread on soft cotton or linen and so kept applied to the affected parts during the night.

If the disease has reached the stage of moisture and swelling in addition to the scaling, it may be necessary at times to apply starch poultices to remove the crusting, and in any case, as the disease is now complicated with staphylococcal infection, the following paste should be first used :—

R	Hydrargyri Ammoniaci	gr. v	Pulveris Amyli	ʒj
	Zinci Oxidi	ʒj	Vaselinum	ad ʒj

Very soon 2 or 3 gr. of sulphur præcipitatum may be added to this, and, finally, if all goes well, sulphur and salicylic paste or ointment may be used.

Where the skin is extensively affected, the borocalamine lotion, either in water or with the basis of caron oil, can be advantageously employed.

The writer advises that young children should be strapped down in bed with bandages round the ankles and wrists, so as to minimize friction. The hair should be closely cropped in all diseases of the scalp. He advocates daily baths, with the addition of permanganate of potash sufficient to colour the water pink, or of half a pound of starch. Ointments as a rule are to be preferred for hairy areas, pastes for moist surfaces, or the latter may be painted twice a week with a lotion of nitrate of silver 15 gr. to the ounce. For the thickened areas often left by chronic eczema, the best application is crude liquid gas tar, painted once a week, or oftener if the skin stands it well.

Eczema of the Vermilion Border of the Lip.—Montgomery³ remarks on the rarity of true vesicular eczema in this site, and records two cases, both females. He recommends treatment with a Saturated Solution of Boric Acid, with 10 per cent Liquor Ammonii Acetatis added. Boric Ointment with 1 to 2 per cent of Camphor added is useful, or Unguentum Hydrargyri Oxidi Flavi 1 per cent.

In fissured lips, which occur more often in the case of the lower than the upper, and in dry scaly lips from exposure, an ointment consisting of 60 per

cent **Lead Plaster**, 38 per cent **Vaseline**, and 2 per cent **Salicylic Acid** is recommended. This ointment is spread on stout cotton cloth and adapted to the lip at night. During the day it is to be frequently smeared on the lip so as to form a protective coating. As advised by Pusey, an adhesive plaster brace may be applied across the lip to prevent it stretching by movements of the mouth. A weak **Nitrate of Silver** solution may be painted in the crack. It is best to do this very thoroughly, and then not to repeat it for several days. In cases in which the crack has existed for a long time, is very deep, and is surrounded by considerable inflammatory infiltration, **Radium** heavily screened and retained for some hours may effect a cure when everything else fails.

For the localized hyperkeratoses of the lower lip, which resemble seborrhoeic keratoses, and not infrequently develop malignant change, the following procedure is recommended. The base should be cleared, either with the curette alone or by first softening the hard masses with **Liquor Potassæ** and then curetting. After curetting, the base may be cauterized with pure **Trichloroacetic Acid**, followed by water or boric-acid solution to prevent overaction. After this, **Boric Acid Ointment** should be used until healing is complete. It is in these cases also that **X-rays** and **Radium** are so beneficial, especially the latter.

Paraffin-wax Baths found useful in eczema vesiculosum (*p.* 16).

REFERENCES.—¹*Arch. of Dermatol. and Syph.* 1920, June, 642; ²*Practitioner*, 1920, July, 47; ³*Med. Record*, 1920, July 24, 141.

EMBOLISM, PULMONARY.

Sir W. I. de C. Wheeler, F.R.C.S.I.

One of the greatest tragedies in surgery is the occurrence of pulmonary embolism following in many cases a simple abdominal operation. Attention should be directed to prophylaxis, as pulmonary embolism of a serious kind does not lend itself to successful treatment. It appears certain that some local infection, often without the formation of pus, is the starting-point in the breaking down and detachment of soft venous thrombi. There is a wide difference of opinion regarding the frequency with which pulmonary thrombosis occurs as a primary condition or is due to an embolus. Thrombosis rarely occurs till one week after operation; from the tenth to the fourteenth day is the usual time; but sometimes it is as late as one month. When the condition arises in the veins of the leg, recovery is usually complete in from two to three weeks. In the rare cases in which femoral thrombosis is followed by pulmonary complications and death, it is probable that a thrombosis co-existed in the pulmonary artery. Death from pulmonary embolism occurred in three cases under the care of the writer. In one the patient dropped dead when getting up for the first time in the third week after a laparotomy. In the second case a small myoma was removed from the uterus; the patient ran a temperature during the second week, but there were no obvious signs of infection. In the third week she was suddenly seized with precordial distress, suffocation, and pallor. There was tumultuous heart action, great restlessness, and the pulse was imperceptible. The condition ended fatally in twenty-four hours, with an interval of ease of three or four hours. The third patient died on the tenth day with similar symptoms after an apparently simple appendix operation. To avoid such catastrophes every effort must be made to prevent even the slightest local infection, with consequent softening and detachment of venous clots. Anæmia may also be a causative factor, and should be dealt with before operation. Prolonged operation in the Trendelenburg position may possibly slow the blood-stream in the extremities and serve as a predisposing cause, but there is no actual proof that such occurs. Hæmostasis must be efficient, as loss of blood during an operation is undoubtedly an etiologic factor. Importance is attached by some authorities to the

traumatization of tissues by retractors, with consequent injury to the deep epigastric veins. The frequent use of retractors may in some small degree account for pulmonary embolism following gynæcological operations. Schneider and Ochsner¹ deal fully with these questions.

Fifty-five *pulmonary complications* with 11 deaths in 1562 operations constitute the study material of Cutler and Hunt.² Post-operative pulmonary complications constitute a serious menace to any patient who submits to operation. Reliable statistics show that one out of every 30 to 50 patients operated on, no matter what the anæsthetic, develops a pulmonary complication, and one among every 150 to 175 patients dies from some such complication. The factors responsible for this are complicated and not always preventable, but an understanding of the mechanism suggests prophylactic measures. Cutler and Hunt believe that embolism from the operative field is the chief factor in the etiology of such complications. It is favoured by (1) sepsis, (2) trauma, and (3) the mobility of the part. Other factors of varying importance are pre-existing lung disease, the irritation of the anæsthetic, and such general factors as old age, chilling, and poor general condition. Such embolism may occur immediately during the operation or during the convalescence, and may be the cause equally of pneumonia, bronchitis, pleurisy, empyema, lung abscess, or fatal pulmonary embolism. Inhalation anæsthesia on top of an existing lung lesion may be the dominant factor in some cases. The following prophylactic measures are suggested: (1) A reduction in operative trauma in an effort to produce as few and small thrombi as possible; (2) Every effort in septic cases to prevent further extension of infection so that bacteria will not be present in the blood-stream, nor sepsis aid in the setting free of thrombi; (3) To avoid, if possible, operating on patients with an existing lung lesion, however slight; (4) Avoidance of chilling both by cold packs in laparotomies or by widely gaping wounds and by exposure after operation; and (5) To make each case before operation as good a risk as that individual case can be made.

REFERENCES.—¹*Ann. of Surg.* 1920, July, 91; ²*Arch. of Surg.* 1920, July (abstr. in *Jour. Amer. Med. Assoc.* 1920, Aug. 14, 501).

EMPHYSEMA. *Aspidosperma* recommended for (*p.* 5).

EMPYEMA. (*See THORAX, SURGERY OF.*)

ENCEPHALITIS LETHARGICA (Epidemic Encephalitis). (*See also INFECTIOUS DISEASES PREVENTION.*) *J. Ramsay Hunt, M.D.*

During the past year this affection has appeared in epidemic form in many parts of the world, and, when not fatal, has often left in its wake serious sequelæ referable to the central nervous system. Many clinical types have been encountered during the epidemic, which occurred only with the greatest rarity in the sporadic form.

HISTORICAL ASPECTS.—It is very probable that similar epidemics have occurred from time to time in the past, often in association with influenza. Crookshank¹ presents an interesting review of the historical aspects of epidemic encephalomyelitis. He states that the clinical manifestations which of late years have become associated with the names of encephalitis acuta hæmorrhagica, polio-encephalitis, and poliomyelitis, have, there can be little doubt, prevailed from time to time, during many centuries, in epidemic form. The occurrences are not new; they have been described again and again in unmistakable language; but, since the overlying nosological, pathological, and etiological conceptions have been ever-varying, we have failed to recognize the historical continuity of the realities. The history of epidemic encephalo-

myelitis is, therefore, not that of 'one disease', but of many; for what we call 'diseases' are not natural objects, but conceptual. He summarizes his investigation as follows:—

Clinical occurrences of the nature that we now ascribe to encephalomyelitis, or encephalomyelomeningitis, have been recorded in modern times for at least 450 years.

In great part these occurrences have been noted as incidental to major prevalences known historically as the sweating sicknesses, the epidemic catarrhs, or influenzas, and the like.

Special prevalences of these occurrences have also been described as manifestations of special diseases. These special prevalences have usually appeared shortly before or shortly after major 'influenzal' epidemics, or else in geographical proximity to endemic-epidemic and endemic influenzal prevalences.

Epidemic encephalomyelomeningitis represents an intensive and specialized reaction that has the same epidemiological relation to pandemic influenza as have the prevalences and epidemics of 'septic' pneumonia, of gastro-intestinal illness, and of other maladies described as occurring before and after the wide diffusions generally referred to as pandemic influenza.

Owing to the relative infrequency of epidemic encephalomyelitis, and its marked variation in type, historical investigation is necessary in order that contemporary occurrences be reviewed in a correct perspective.

SYMPTOMS.—Barker, Cross, and Irwin² review in detail their clinical experience with the epidemic which was prevalent in the United States in 1918–19.

Onset.—This may be sudden or gradual, and with or without prodromata (asthenia, lassitude, headache, vomiting). Some of the patients regard the attack as influenzal; others give a history of having had influenza a few days or a few weeks before; still others assert they have not had influenza at all. The general encephalic symptoms may, in some cases, be the more marked at onset; in others, focal symptoms, referable to brain or spinal cord, or signs of meningeal irritation, announce the presence of a nervous disease.

General Symptoms.—The most striking symptom, when it is present, is a pathological drowsiness. All grades of this disturbance (apathy, dullness, somnolence, sopor, stupor, coma) may be met with, either in a single case or in a series, and either at or near the onset or later in its course. Some patients, however, do not manifest the symptom at all.

Other disturbances of the general consciousness, including mental depression, anxiety, and delirium, also frequently occur. A patient may be drowsy in the day-time and complain of insomnia and restlessness at night.

Headache, vertigo, tachycardia, and vomiting are common general symptoms. Outspoken choked disc was not present in any of the cases. Fever may or may not be present at the onset, but is usually evident at some time. It was slight in most of the cases observed. In some cases there is marked pyrexia, 102° to 103°, lasting for from one to a few days.

Focal Symptoms.—These are predominantly motor rather than sensory. Commonest by far are bilateral nuclear and radicular paralyses of the eye muscles of well-known type, with ptosis and ophthalmoplegia externa et interna (polio-encephalitis superior acuta, involving III, IV, and VI); but pontile and bulbar nuclear and radicular paralyses, with facial paralysis, dysmimesis, dysphagia, dysarthria, etc. (polio-encephalitis inferior acuta, involving V (motor), VII, IX, etc.), are also common, as are symptoms pointing to paralysis of part of the extrapyramidal motor system (Parkinsonian mask, loss of normal facial innervation accompanying the emotions). Less common motor disturbances, though they may occasionally be encountered, are monoplegias, hemiplegias, diplegias, aphasias, contractures, choreatic and

athetotic disturbances of motility, and general or circumscribed convulsive seizures. Focal phenomena of a sensory nature are less frequent than those of a motor nature above referred to. Nevertheless, sensory symptoms due to focal lesions of the sensory areas (cortex) and paths (corona radiata, lemnisci) are occasionally met with (hemi- or mono-anæsthesias, paræsthesias, hyperæsthesias, algias, more rarely hémianopsia).

Acute ataxias of different types (according to the localization of the lesions) may be exhibited.

Meningeal Symptoms.—Only in relatively few cases are the clinical signs of an outspoken meningeal irritation present.

Cerebrospinal Fluid.—This may or may not be under increased pressure. The fluid looks perfectly clear, and no film, as a rule, forms on standing. In some undoubted cases of the disease the cell-count has been normal and the globulin test negative, though they would have been overlooked because of the apparently normal macroscopic appearances had the examiner failed to make a cell-count and a globulin test. In the author's experience, a cell-count in the cerebrospinal fluid of from 10 to 100 small mononuclears, along with a positive globulin reaction, with negative Wassermann and negative bacteriological smears and cultures, is, at the time of an epidemic of encephalitis, strong corroborative evidence of the existence of the disease. Negative findings in the cerebrospinal fluid do not, however, rule out the disease.

The Blood.—A slight leukocytosis is usually present. The white-cell count varied between 3053 and 17,600 per c.mm., except in one instance in which it was 22,850. The differential count of the white cells usually, though not always, reveals a slight relative and absolute increase in the polymorphonuclear neutrophil elements.

The Urine.—A trace of albumin and a few casts are sometimes demonstrable, doubtless due to a slight toxic degenerative nephropathy such as is met with in most acute infectious processes. Renal function, as far as the phthalein test has been applied, appears to be unimpaired.

DURATION OF THE DISEASE.—Whether the disease terminates in death or in recovery, the course may be either brief or prolonged. In severe fulminant cases death may occur in a few hours or days. In many instances, both mild and severe, recovery has been rapid, the symptoms lasting from a few days to a month. In the majority of cases, however, the disease is a protracted one, extending over many weeks, and in some instances over several months.

Stephen and Bulchandani³ describe a small epidemic which occurred in Karachi, India, in November, 1919.

CLINICAL TYPES AND SYMPTOMS.—The occurrence of unusual types was a striking feature of the second year of the epidemic (1919-20), and they were noted by many observers in different parts of the world. Some appeared late in the course of the epidemic, and were probably associated with attenuated forms of the virus.

C. von Economo¹ describes a *hyperkinetic-mylitic form* with the following clinical characteristics. Initial stage: acute onset, chilly sensation, fever and neuralgic pains often of great severity; delirium soon follows, often of the occupation type, and resembles closely alcoholic delirious states. The hyperkinetic stage follows in the course of a few days, and is usually first manifested in the abdominal musculature, often on one side. The muscular phenomena are of the myoclonic type, and in severe cases assume the proportions of chorea. Fibrillary twitchings are also present. The diaphragm may be involved. Fever persists, and many cases succumb at this period of the disease. The third stage is termed the lethargic, and is characterized by somnolence and cranial-nerve palsies. If the patient survives, there is a very

gradual convalescence which extends over a period of weeks or months. Sometimes slight recrudescences are noted, with return of the myoclonus and facial palsy, showing the slow elimination and persistent activity of the virus.

Von Economo also calls attention to the occurrence of a *tabetic type* of encephalitis lethargica in Austria. This form is characterized by sluggish reactions and inequality of the pupils, and in some cases myosis and the typical Argyll Robertson pupil have been observed. In addition there may be diminution or loss of the knee-jerks and Achilles-jerks. Such cases may give rise to great diagnostic doubts and difficulties, and a correct interpretation is only possible after serological tests eliminating syphilis. Pupillary disturbances were noted in 60 per cent of the cases in the Vienna epidemic of 1919-20. A knowledge of the existence of this tabetic type, and especially of the Argyll Robertson pupil, are of the greatest importance, and must be considered in the diagnosis of *tabes dorsalis*.

The writer also speaks of the frequency of mild abortive types, *formes frustes*; and of rare symptoms—e.g., neuralgia, deafness, peripheral palsies, masseter spasm, bulbar palsy, followed by atrophy and fibrillation. He has also observed cortical epilepsy, merging into paralysis of cortical origin.

In summing up his pathological investigation, he emphasizes the occurrence of spinal-cord changes in the epidemic of 1919-20, in contrast to the findings of the previous years. The inflammatory areas were localized in grey matter, and chiefly in the anterior horns. In certain areas the microscopic picture of acute poliomyelitis was produced. Inflammatory foci were also present in the posterior horns, and may have caused the persistent neuralgic pains in certain cases. The hyperkinetic symptoms (myoclonus) may have been produced by the anterior-horn lesions.

The *paralysis agitans syndrome, choreic and athetoid movements*, are among the curious sequelæ which have followed in the wake of epidemic encephalitis. Recent micropathological investigations have shown the relationship of these symptoms to the corpus striatum, a region of the brain which shows frequent involvement in lethargic encephalitis. It is therefore not surprising to encounter the clinical evidences of paralysis agitans (Parkinsonian mask, general rigidity, and tremor) in this disorder, as well as involuntary movements of a choreo-athetoid type. Marie and Lévy⁵ report from the clinic of Salpêtrière 15 cases of involuntary movements which followed lethargic encephalitis, or a slight febrile disturbance which was regarded as *grippe*. The first 10 cases occurred in the summer of 1918, and the motor symptoms appeared approximately two and a half months after the initial infection. The movements were of three types: (1) Choreatic or athetoid, bilateral or unilateral; (2) Rhythmical tremor, associated with the rigidity of paralysis agitans; (3) Coarse spontaneous movements of large amplitude, at times synchronous, and especially marked in the root segments of the limbs. In some cases the trunk muscles were affected, causing a curious distortion of the gait and station. The third type of involuntary movement the authors find unique, and they do not believe that it corresponds to any of the classical descriptions. All of the 15 cases occurred in middle life. There were no other evidences of disease of the central nervous system, save in a few cases slight exaggeration of the tendon reflexes and a unilateral Babinski phenomenon. The serological examinations were negative. In all of the patients a tendency to improvement and recovery was noticeable. After the lapse of one year, one patient showed some slight rigidity and the tremor of paralysis agitans in one hand; six still had slight involuntary movements of the choreiform type, which were increased by fatigue and emotion.

In another paper also Marie and Lévy⁶ discuss the Parkinson syndrome in lethargic encephalitis, and the differences which it presents from true paralysis

agitans. The onset of symptoms is abrupt, and the extremities, as well as the trunk, are involved *en masse* at the same time. The slow progressive hemiplegic type of Parkinson's disease is entirely lacking. The typical fine tremor of true paralysis agitans, which is diminished or ceases during voluntary movements, they have not observed. The post-encephalitis tremor is coarse, of large amplitude, and is augmented by voluntary movement.

There is a distinct tendency for these symptoms to regress, and in most of the cases they have gradually diminished and finally disappeared. This, however, is by no means always the rule.

Choreo-athetoid and choreopsychotic syndromes are described as sequelæ by La Salle Archambault.⁷ He reports in all 7 cases, 3 of the choreo-athetoid and 4 of the choreopsychotic types. All were preceded by well-defined symptoms of encephalitis lethargica—fever, somnolence, and cranial-nerve palsies. During all of the disease evidences of a choreiform restlessness were manifested, which became more marked during convalescence, and persisted after other symptoms had subsided. Some of the movements were of an athetoid quality, and there was a tendency to hemilateral involvement. There were no evidences of involvement of pyramidal tracts. Some slight indications of the paralysis-agitans syndrome were also present, consisting of mask-like expression of face, slight hypertonicity of the musculature, and occasionally rather coarse tremors occurring during movement. The choreopsychotic type was characterized by symptoms of an acute confusional psychosis with choreiform movements. These movements were similar to those observed in Huntington's chorea, but were also associated with slight evidences of the paralysis agitans symptomatology. Archambault states that these movements differed from those of myoclonus multiplex, which have been so frequently observed in the course of the epidemic, and were unquestionably of the choreiform athetoid type. In some of the cases the movement was characterized by a very massive displacement of the part, with a curious tendency to rhythmical repetition. He considers it probable that the causative lesion is localized in the corpus striatum. In one case pathological study showed hæmorrhagic foci in the corpora striata. Cecil Alport⁸ also reports a typical case followed by paralysis-agitans rigidity on the second day, and a fortnight later rhythmical athetoid contractions of the right arm and leg made their appearance. These symptoms gradually diminished in intensity, but were still present in slight degree six months later.

Of special interest is the report by Nixon⁹ of a boy, age 7, who as far back as the year 1908 presented unmistakable symptoms of what we now recognize as lethargic encephalitis, which terminated in the 'paralysis-agitans syndrome'. The case was under observation in the Bristol Royal Infirmary, and as he slowly recovered, it was noticed that he held his hands and fingers in a position suggesting the carpal spasm of tetany. This was not present in the feet. He also developed a constant tremor in the head and hands, much increased on voluntary movement. Eventually the boy left the Infirmary in the condition of a case of well-marked 'paralysis agitans', with shaking head, 'cigarette-rolling' fingers, a forward stoop, and rigid shuffling gait. There was excessive rigidity in all muscles. There seems no reason to doubt that this was a *sporadic case of encephalitis lethargica*. [Sporadic cases of the myoclonus type of epidemic encephalitis have also been observed (*see MYOCLONUS MULTIPLEX, ACUTE INFECTIONS*).—J. R. H.]

Myoclonic Type.—J. A. Sicard¹⁰ reports five cases of epidemic encephalitis with myoclonic symptoms (*l'encéphalite myoclonique*). The onset is characterized by severe neuralgic pains, chiefly localized in the neck, arms, and intercostal region; there is moderate fever, and perhaps slight headache,

but without somnolence or lethargy. After a week or ten days the muscular twitchings appear, which are of the myoclonic type, and not choreiform or athetoid in nature; they are quick and electric in character, and are especially frequent in the region of the abdomen and diaphragm. In some cases they become generalized. During this period the pains as a rule have subsided. Rarely the pains persist. There are no cranial-nerve palsies and no alterations of the tendon reflexes. Sensation is normal. The pupils react normally. As a rule there is insomnia. In the third week symptoms of delirium make their appearance, which in severe cases may pass into an acute confusional psychosis, terminating in stupor. The evolution of the affection requires from four to eight weeks. The cerebrospinal fluid shows but few deviations from the normal; in some cases in the later stage there was slight lymphocytosis and slight increase of globulin. Sicard regards the condition as a special clinical type of epidemic encephalitis. L. Dimitz¹¹ observed a large number of similar cases (forty-five) in Vienna during the winter of 1919-20; but, contrary to the usual opinion, he regards the motor disturbances as choreiform in type and not those of myoclonus.

The myoclonic form has also been observed by W. M. Ellis¹² at the London Hospital in three instances. All three cases presented the combination of insomnia, followed by acute delirium, and rhythmical spasmodic contractions of muscles. In all, the abdominal muscles were most affected. Insomnia was severe, and led up to a mild delirium of the delirium-tremens type; in one patient the insomnia was preceded by drowsiness. In all cases the most striking feature was the forceful, shock-like contractions of the abdominal muscles, which occurred at the rate of thirty to forty to the minute. The pupils were widely dilated, and there was profuse sweating and tachycardia. Fever, usually of low degree, was present in all. In two of the three speech was affected, jerky, indistinct, and slurred. Paresis of the eye muscles was present in one case and doubtful in another. One patient showed nystagmus. All three patients had a well-marked leucocytosis, with a slight relative increase of the polynuclears. The urine presented a trace of albumin in two cases. The spinal fluid showed a very slight increase of cells and protein in all three cases, in two of these barely above the possible normal variation. In all three patients the disease was fatal.

A myoclonic form of epidemic encephalitis was also described by Boveri¹³ in Milan. This myoclonic form naturally leads us to ask whether we are in the presence of the disease described by Dubini, and called by him 'electric chorea'. It has not been mentioned since his time (1840-70). It is nearly always a fatal disease, characterized by muscular contractions occurring at different intervals, but always identical in each case, as if produced by a repeated electric current. These convulsions affect at first a finger or limb (more frequently the right upper limb) or one-half of the face (the right), and in a few days invade the whole of that side of the body. Dubini added that, in addition to these rhythmic movements, convulsive attacks might occur two or three or even more times a day, giving way afterwards to paresis and paralysis. It is possible that Dubini's disease might be connected with the myoclonic form of epidemic encephalitis as observed in the present epidemic.

That these myoclonic cases are really epidemic encephalitis caused by the same etiological agent as the lethargic form remains, of course, yet to be proved. If the etiological agent is the same, the occurrence of this new form of case, which in the opinion of the French authors amounts to a fundamental change in the type of the disease, is presumably associated with a tendency of the virus to new localization in the central nervous system. Such a change is of profound interest, both in the general problem of specific localization of

infections, and in the narrower problem of the change of characteristic localization of a given infection during its epidemic evolution.

Psychic Forms of Epidemic Encephalitis.—Among the interesting clinical types which are related to this disorder the acute mental disturbances have assumed a not unimportant place. These may accompany the various organic types of the disease, or may occur in more or less isolated form coursing under the picture of pure psychoses. It is to be understood, however, that these various psychic forms may complicate any of the classical organic types of the disease. Hesnard¹⁴ gives a general review of these, and divides them into the following types:—

1. *Psycho-somnolent type*, developing on the basis of lethargy and somnolence which is so characteristic of the disorder. The psychic symptoms are characterized by excitement, similar to hypomanic states. It is complicated by hallucinations and mental confusion, and later there develops a tendency to depression and obnubilation *en masse* of the intellectual function.

2. *Catatonic stupor*, characterized by mental and physical sluggishness and impassivity which produce the clinical picture of catatonia. There is not always a tendency to fixation of the movements as in true *flexibilitas cerea*, but the immobility is nevertheless striking and extreme. He differentiates this form sharply from the rigidity of the Parkinson syndrome, and places the disorder in the sphere of the psychomotor rather than of the pure motor disturbances. These patients are usually lucid, and do not as a rule present the confusion so common in other types. They recover without amnesia. He believes that there are transition forms between this psychomotor type and the Parkinson group. The prognosis is variable. Some of the patients recover without a trace of the previous illness, while others sink gradually into a state of grave confusion with stupor which terminates fatally.

3. *Acute delirious form*, similar to that observed with intoxications and infections. There is delirium with agitation which is frankly hallucinatory. This progresses rapidly to confusion and incoherence and excitement. There is tremor, incontinence, dry tongue, and rapid pulse.

4. *Confusional form*, comparable to the confusional psychoses of the acute infections. The common form is with mental torpor, which in its milder manifestation produces the clinical picture of the *syndrome bradypsychique*, with difficulty and retardation of the voluntary reaction.

5. *Korsakow's syndrome*, characterized by disorientation and errors of memory, together with mental confusion and instability. These symptoms may persist after the acute phase, together with a tendency to confabulation. This type is only observed in the severe diffuse forms of the disease, usually with symptoms of neuritis or more frequently polyneuritis. It may, however, occur without these complications, and represents a purely psychic form of the Korsakow syndrome. After the acute symptoms have subsided, it may leave in its wake disorder of orientation, enfeeblement of the memory, and a tendency to fabricate.

Other sequelæ of psycho-encephalitis of a more general nature have also been observed (*séquelles psychopathiques*). Among these may be mentioned involvement of the higher intellectual function, alterations of character, instability, depression, irritability, and the like.

There is another interesting group, not large, which has been characterized by a long prodromal period of mental symptoms continuing for a period of two months, a typical febrile neurological picture of the disorder. The mental symptoms through the prodromal period may be those of excitement (hypomania), confusion, or a pseudodementia resembling closely dementia præcox. Hesnard describes briefly the possible pathological factors involved in the

production of this psychosis, among which may be mentioned localization of the inflammatory process in the meningeal cortical structures, together with an infiltration of the neural elements with toxins of the disease.

Chronic Relapsing Type of Encephalitis Lethargica.—This form has been described by von Economo.¹⁵ Its recognition is very important from the diagnostic and prognostic standpoint, as the general opinion is that after the subsidence of the acute symptoms of the attack, the tendency is toward improvement and recovery, either complete, or with residual defect depending upon the gravity of the illness in the central nervous system. Von Economo goes on to show the possibility of a lighting up of the old process in the form of relapses, with steady progression to a fatal termination, over a period of two years. The onset of the disorder in his case occurred in the usual manner, with pains, fever, somnolence, and delirium, soon followed by a dysarthria and general rigidity. These symptoms continued for about two months, and then there developed choreo-athetoid movements of the extremities, and evidences of pseudobulbar palsy, weakness of the tongue and soft palate, anarthria, dysphasia, and forced laughter. There was a gradual improvement from this condition, to such an extent that the patient was able to get out of bed and walk. This period of amelioration lasted for several months, when there was a further development of the disorder, and aggravation of the symptoms. The choreo-athetoid movements increased in intensity. Deglutition and speech became difficult; it was necessary to resort to tube feeding, as in the early stage of the disease, although during the improvement the patient had taken nourishment normally. Death occurred two years after the onset of the disease. Careful histological study of the brain-stem showed the existence of both old and recent lesions of inflammatory origin. Side by side with the evidences of the old inflammatory areas were recent hæmorrhagic and exudative foci. This combination of acute and chronic pathological changes is in harmony with the clinical course of the disease—a chronic course, improvement, with acute exacerbation and relapse. It would thus appear that after the fulminating onset of the disease the body has been unable to eliminate the virus, which has persisted and given rise to slowly progressive inflammatory changes. This case shows that the disease may remain smouldering for fully two years, with signs of extension of the inflammation from one part of the brain to the other.

Buzzard and Greenfield¹⁶ also call attention to the fact that months after the original illness relapses may occur, attended by voluntary movements which may be regular and choreiform in distribution.

Ocular Manifestations of Epidemic Encephalitis.—These are of particular interest because of their frequency and diagnostic importance.

Lapersonne¹⁷ gives an interesting review of this phase of the subject. Optic neuritis is quite rare, and is usually encountered in the early stage of the disease, in association with headache, slight rigidity of the neck, and a moderate degree of lymphocytosis of the cerebrospinal fluid. Ocular palsies are met with very frequently, and constitute in conjunction with lethargy and asthenia a characteristic group of symptoms. In ambulatory patients these palsies are distinguished by dissociation, their transitory character, and a tendency to recrudescences. Unilateral palsy of the abducens nerve is very rare. It may be associated with third-nerve paralysis, causing almost complete external ophthalmoplegia. Third-nerve palsies of all degrees are very common. Ptosis is a frequent symptom, and isolated *paralysis of accommodation* is by no means rare. Very interesting are the paralyses of associated movements—viz., convergence, and ocular movements to the right or left. True nystagmus in epidemic encephalitis is rare: slight nystagmoid move-

ments are not uncommon, a result of weakness of one or more of the ocular muscles. All of the various forms of ocular palsies are referable to lesions of the grey matter of the mid-brain, a polio-encephalitis superior.

R. Cords¹⁸ reports the ocular symptoms in a series of 20 cases. The most frequent symptom is ptosis, which was noted in 14 cases. It was probably present in other patients, but could not be demonstrated because of the mental condition. In 8 cases diplopia was an early symptom. The third nerve is most frequently affected, and more especially the internal rectus (5 cases), superior rectus (1 case), inferior rectus (1 case). In one patient both internal recti were paretic for lateral movements but showed a normal reaction on convergence. The fourth nerve was not affected in any case. The sixth nerve showed involvement in 4 cases, and in one the paralysis was bilateral. Associated paralyses occurred with unusual frequency. Continued associated palsy of the upward and downward movements occurred in 3 cases; convergence palsy in 8 cases; weakness or paralysis of accommodation in 3 cases; nystagmoid movements occurred in 8 cases. In 8 cases the light reaction was absent, and in 4 a sluggish response was obtained. In 5 of these the reaction on accommodation was sluggish, and in 3 active. Paralysis of the pupil on accommodation, with preservation of the light reaction, was observed in several patients. In only one case was a light degree of papillitis present. In conclusion, the writer emphasizes the association of somnolence with paralysis of the motor oculi, and recalls the theory that a sleep centre may be localized in this region.

Of 7 cases reported by Woods,¹⁹ in only one case was there optic neuritis, and this was of low grade. In 3 cases there was serious impairment of accommodation, and the pupils were dilated, sluggish, and at times inactive. In another case the patient's age prevented accommodation tests, but the pupils presented similar conditions. These 4 patients showed other defects: involvement of other branches of the third nerve, abducens and facial paralysis. Of special interest were the nystagmoid movements, which occurred in 5 of these 7 cases. In 2 cases they were the only signs pointing to involvement of the eye muscles.

Among the rarer ocular complications is the occurrence of *bilateral sympathetic ophthalmoplegia*. It is well established that the pons and the medulla oblongata are traversed by a tract containing oculopupillary fibres. A lesion of this tract causes contraction of the pupil, narrowing of the palpebral fissure, and slight retraction of the eyeball of the same side. The tract passes through the dorsomedial region of the pons and medulla oblongata. Focal disease of the pons and medulla may therefore produce symptoms of 'sympathetic ophthalmoplegia'. This sign, however, has rarely been observed on the two sides at the same time. Recently W. B. Cadwalder²⁰ observed two cases of lethargic encephalitis in which both pupils were contracted and both palpebral fissures were narrowed—that is, the signs of bilateral 'sympathetic ophthalmoplegia'. In one of these the clinical diagnosis was confirmed by post-mortem examination. Bilateral involvement of the sympathetic fibres of the eyes can be caused only by a diffuse or inflammatory lesion of the brain-stem, so that when it is associated with the characteristic mental confusion of lethargic encephalitis it should be regarded as a diagnostic sign of that disease. However, because of the bilaterality of the narrowing of the palpebral fissures and contraction of the pupils, it is not likely to attract attention, and is overlooked; but when it occurs only on one side at the time, the contrast quickly directs attention to it.

Mild Abortive Types.—Farquhar Buzzard and Greenfield,²¹ in commenting on several cases of mild encephalitis in which the physical signs were generally

trivial and but for careful examination would easily have escaped notice, express the view that the total number of cases must have been very numerous during the last two years. Mild cases, they state, are characterized by an inclination to fall asleep while sitting down to rest, a tendency to forget the small things of everyday life, and sometimes by an alteration of temperament. The patient may complain that although he is always dropping off to sleep in the daytime, at night he is restless and disturbed by mild cramps or pains in the limbs, so that he wakes every hour or two. In such cases there may be neither headache nor fever, and diplopia may be very transitory; diagnosis therefore may be difficult, and the history given by the patient a most important factor. Yet early diagnosis is a matter of great consequence, since patients suffering from inflammation of the brain should be prevented from carrying on their normal activities, even though not troubled with headache, vomiting, or pyrexia.

Cases Simulating Surgical Abdominal Lesions.—Massari²² emphasizes the occurrence of cases of encephalitis lethargica which closely simulated surgical affections of the abdomen—e.g., appendicitis—and records six examples. The resemblance occurs in the early febrile stage of the disease, when there is abdominal pain and rigidity, possibly unilateral. Later the development of twitchings of the abdominal muscles and the diaphragm settles the diagnosis.

BACTERIOLOGY.—During the course of investigations carried on within the past year, Strauss, Hirshfeld, and Loewe²³ believe they have established the fact that epidemic encephalitis is due to a filtrable virus, of which they have reported the successful cultivation. The experimental work embodied in these reports demonstrated the close relationship of the virus and the micro-organism to the nasopharynx. Berkefeld filtrates of nasopharyngeal mucous membrane from fatal cases of epidemic encephalitis, and cultures of these filtrates when injected intracranially into monkeys and rabbits, produced the typical clinical and pathological pictures of the disease. In view of these findings they were led to investigate, by animal inoculation and cultural studies, the nasopharyngeal washings and the cerebrospinal fluids of patients suffering from epidemic encephalitis. Their conclusions are as follows:—

The Berkefeld filtrates of nasopharyngeal washings from cases of epidemic encephalitis produce characteristic lesions when injected intracranially into rabbits. This finding has served as an aid to diagnosis in 78 per cent of the cases so tested. A minute filtrable organism, identical with that described before by them, has been recovered in 11 of the 17 nasopharyngeal washings cultivated.

Inoculation of rabbits with the cerebrospinal fluids of patients with epidemic encephalitis confirmed the diagnosis in 12 of the 16 fluids injected.

Cultures of cerebrospinal fluids have been positive in 10 out of 20 cases.

The positive results with cerebrospinal fluid would seem to differentiate this disease from poliomyelitis. Control studies were uniformly negative.

Harvey and Levaditi²⁴ report their inoculation experiments with an emulsion of the brain from a grave and rapidly fatal case of encephalitis. The inoculations were intracerebral, and proved negative both in rabbits and in a monkey. The authors believe that because of this experimental evidence, as well as from certain differences in the histological characteristics of the lesions, encephalitis lethargica is to be distinguished from poliomyelitis.

Cultures made by Morse and Crump²⁵ from fluid aspirated from the lateral ventricles of the brain in six cases resulted in securing uniformly pure cultures of a non-motile coccus, small in young cultures, as large as a staphylococcus in old cultures, with a tendency to grow in diplococcus and tetrad forms and to bunch in small clusters. It divides similarly to a staphylococcus in three planes, stains readily with the aniline dyes, and is Gram-positive.

PROGNOSIS.—Bramwell²⁶ sums up the prognosis as follows :—

The mortality in encephalitis lethargica varies considerably, to judge by the recorded experience of different observers. Thus, 6 cases of 11 reported by von Economo, 7 of Netter's 15 cases, 2 of Wilson's 13 cases, and none of Hall's 16 cases died, while 9 of the 57 cases he observed terminated fatally. The mortality among 126 cases collected by the Local Government Board in 1918 was 20 per cent; while of the 61 cases observed in the Winnipeg epidemic more than a third died. According to Netter, death may be due to an extension of the encephalitis to the medulla, to pneumonia secondary to paralysis of vagus or glossolaryngeal, or to general wasting complicated by bed-sores.

Improvement is almost always slow in those cases which eventually recover. The patient may remain for weeks or even months in a state of semi-stupor. On the other hand, abortive cases are met with, and are very possibly much more frequent than supposed, in which recovery is practically complete after two or three weeks. Sometimes the general phenomena pass off in a few weeks, leaving merely focal symptoms, which may be very persistent. Complete or practically complete recovery was the rule in the majority of the cases he met with. In several, however, such symptoms as general weakness, slow mental action and defective concentration, want of initiative, giddiness, defective vision, sluggish pupils, and ocular pareses with diplopia still persist and will probably prove to be permanent.

TREATMENT.—Netter²⁷ is convinced that the virus of lethargic encephalitis is of the same type as that of poliomyelitis, and, like it, is filtrable, and to be found not only in the nervous system, but in the nose, throat, and mouth. He bases his treatment upon this conception. Though he thinks that some value is to be attached to specific treatment by the intrathecal injection at the onset of the disease of serum taken from a patient who has recovered from it, he considers it premature to recommend this method, for the reason that there is no evidence that an antibody appears in the blood in lethargic encephalitis at an early date, and also for the further reason that in a case lasting several months it would be necessary frequently to repeat the injection. He believes that the administration of Hexamine is likely to be useful, but insists that it must be given by the mouth and not by intravenous injection, since the object is to produce a continuous action on the nerve centres, and the drug disappears very rapidly if injected into the blood.

His great stand-by in treatment, however, is the **Production of a Local Abscess by an Injection of Turpentine**. In all serious cases he injects at the earliest possible date 1 or 2 c.c. (16 to 32 min.) of turpentine into the outer side of the thigh. In 27 cases so treated, an abscess, requiring incision, was produced in 19; only 2 of the 19 died, and 13 of them, who had been in an apparently hopeless condition, recovered completely. That is to say, he had 17 recoveries out of 19 cases in which an abscess formed; whereas of 25 serious cases not so treated, 13 died. Of the 19 cases, 14 were of the myoclonic type in which the prognosis is said to be particularly bad. Why the injection of turpentine, leading to the formation of an abscess, should produce such a favourable effect, Netter does not find it possible to explain; but he suggests that the reaction caused by the turpentine affects the organs which produce the bodies that enable the system to defend itself against the disease. He considers that the various serums, vaccines, prepeptones, and nucleinates that have been recommended have probably produced their effect in the same way, but are not so free from danger as the production of an artificial abscess.

Finally, he condemns very strongly the use of arsenic, having seen neosalvarsan produce a disastrous result; and antimony he says is useless.

Autoserum therapy (intraspinal) has been tried by I. C. Brill.²⁸ He concludes from its use in three cases that this therapy appears to influence favourably the course of the disease, causing a rapid disappearance of motor disturbances and mental depression.

REFERENCES.—¹*Boston Med. and Surg. Jour.* 1920, Jan. 8, 34; ²*Amer. Jour. Med. Sci.* 1920, March, 337; ³*Indian Med. Gaz.* 1920, March, 81; ⁴*Wien. klin. Woch.* 1920, April 15, 329; ⁵*Médecine* 1920, Feb., i, No. 5; ⁶*Bull. de l'Acad. de Méd.*, 1920, lxxxiii, 83; ⁷*Arch. of Neurol. and Psychiat.* 1920, iv, 488; ⁸*Lancet*, 1920, ii, 553; ⁹*Bristol Med.-Chir. Jour.* 1920, March, 25; ¹⁰*Presse méd.* 1920, April 1, 213; ¹¹*Wien. klin. Woch.* 1920, Feb., 163; ¹²*Lancet*, 1920, ii, 114; ¹³*Brit. Med. Jour.* 1920, i, 570; ¹⁴*L'Encéphale*, 1920, July 10, 443; ¹⁵*Munch. med. Woch.* 1919, Nov. 14, 1311; ¹⁶*Brain*, xlii, pt. iv.; ¹⁷*Presse méd.* 1920, July 21, 473; ¹⁸*Munch. med. Woch.* 1920, May, 627; ¹⁹*Arch. of Ophthalmol.* 1919, Nov., No. 6, and *Jour. Amer. Med. Assoc.* 1920, Jan. 10, 131; ²⁰*Jour. Amer. Med. Assoc.* 1920, May 8, 1315; ²¹*Brain*, xlii, pt. 4, and *Brit. Med. Jour.* 1920, i, 578; ²²*Wien. klin. Woch.* 1920, March 4, 214; ²³*Jour. Amer. Med. Assoc.* 1920, May 15, 1373; ²⁴*Presse méd.* 1920, Feb. 11, 119; ²⁵*Jour. Amer. Med. Assoc.* 1920, March 27, 915; ²⁶*Lancet*, 1920, i, 1152; ²⁷*Brit. Med. Jour.* 1920, i, 578; *Jour. Amer. Med. Assoc.* 1920, June 5, 1604, and *Presse méd.* 1920, April 7, 193; ²⁸*Med. Record*, 1920, June, 1079.

ENDOCARDITIS, SUBACUTE BACTERIAL. Carey Coombs, M.D., F.R.C.P.

This matter was fully discussed at the British Medical Association meeting at Cambridge,¹ Sir Thomas Horder introducing the subject.

DEFINITION.—The term is applied to a group of cases which has also been labelled 'endocarditis lenta', 'chronic ulcerative endocarditis', and so on. Horder described it as follows: "The onset is most often insidious; the general symptoms include loss of strength and tone, a sallow complexion with anæmia, moderate loss of weight, and fever; the heart gives evidence of endocarditis at some time or other in almost all cases, and in the majority there has been previous valve injury; widespread arterial embolism takes place; in most cases blood cultures are positive, the isolated bacterium being either a short streptococcus, much less often Pfeiffer's bacillus, and rarely a micro-organism difficult of identification, but in all cases the microbe is of low pathogenicity. The total duration of the illness is from three months to two years . . . ; death occurs from toxæmia, from heart failure, from uræmia, or from cerebral or coronary embolus. The post-mortem findings include a vegetative endocarditis on the valves or wall of the heart, with little or no ulceration, and widespread embolic infarction without suppuration; as a result of the embolic process there is found a form of glomerular nephritis more or less characteristic of the disease".

ETIOLOGY.—The patient is usually a young adult. From various quarters there is evidence of a high incidence of this disease at the present time. This is in part due to its occurrence in a number of demobilized men. It is usual to find a history of pre-existent valvular fibrosis, due usually to old rheumatic carditis; but in these men a majority appear to be free from such defects. Of Starling's 38 service patients only 7 gave a history of rheumatic fever, while the fact that a majority had been able to carry on active service without symptoms until shortly before the existence of active endocardial infection was observed, proves the absence of any serious pre-existent defect of their valves. Wounds furnished a possible explanation of the infection in only a very small proportion. Probably depression of general resistance by fatigue, etc., is an important factor.

PATHOLOGY.—Usually the infecting organism is a streptococcus akin to those normally found in the saliva and feces. There are similarities between this type of streptococcus and that associated with rheumatic carditis. Some observers regard them as identical, but probably there are differences. There is no evidence to show by what avenue this organism reaches the cardiac

valves. The fact that (apart from the special war group alluded to above) the valve attacked is often already fibrosed by previous rheumatic infection seems to suggest that the organisms get into the valve through its own vessels, which are increased in number by the vascularizing effect of a previous inflammation. But there is usually nothing to show how these micro-organisms get into the systemic circulation to begin with. The aortic valve is more often attacked than the mitral—a point of difference from rheumatic carditis. Another point of difference is the relative rarity of pericardial and myocardial lesions in subacute bacterial endocarditis, whereas they are practically constant in rheumatic carditis. The glomerular nephritis alluded to above is highly characteristic (cf. Baehr²). It is often the immediate cause of death, by adding uræmia to the patient's other embarrassments.

SYMPTOMS.—The onset is always insidious. The pale complexion, sometimes with a brownish tinge, is a notable feature. Loss of weight and strength is associated with a cheerful placidity of mind. A curious and fairly common symptom is clubbing of the fingers. Horder divides the main signs into four groups:—

1, *Multiple embolism.* Petechiæ of the skin, especially about the neck and shoulders, occur singly or in crops. If single they are easily overlooked unless searched for carefully and often. Painful spots, sometimes visibly erythematous, are apt to develop in the tips of the fingers or toes. Pressure will sometimes discover these by their tenderness even when they are invisible. Anomalous arthritic swellings fall into the same embolic category. Splenic enlargement, a very frequent symptom, is sometimes due to infarction, sometimes to a diffuse infective swelling. The urine nearly always contains traces of glomerular embolism in the shape of blood-corpuscles, if a number of examinations are made. Finally, retinal hæmorrhages should always be looked for.

2, *Physical signs of endocardial disease* may be entirely wanting, but this is seldom the case. More often the usual phenomena of valvular disease, especially those of aortic insufficiency, are found, but the observer fails to link these with the covert hints of active infection with which the case furnishes him, and he writes off the valvular signs as due to static fibrosis, the residuum of extinct inflammation. The bruits are constant and do not change from day to day, as is sometimes stated.

3, *Blood cultivation*, according to Horder, is usually positive if several attempts are made—by no means a universal experience. The number of organisms in circulation is probably small (if one may judge from histological data).

4, *Fever* is of an irregular kind, often associated with sweats but rarely with rigors. It is seldom high. Often there are long afebrile periods. The writer has seen these remissions last for weeks, even in cases where autopsy proved that the infective process must have been active.

DIAGNOSIS.—The only way to save oneself from missing cases of subacute bacterial endocarditis is to search for the embolic phenomena detailed above, and to look out for fever, in every case of valvular disease, and particularly in cases of aortic regurgitation in young adults. The blood should be cultivated, several times if possible; but in the writer's view a negative result by no means rules out a diagnosis of active endocardial ulceration.

PROGNOSIS.—This is almost uniformly bad. Whether actual 'cure' does ever occur is uncertain. Even when it seems as if the valvular infection had died out, the heart is left in a dangerously crippled condition, or the patient may die of uræmia due to the renal lesions established during the period of active infectivity.

TREATMENT.—This, unfortunately, does not seem to have any effect. Horder and other speakers detailed various efforts in the direction of vaccine

and serum therapy, but in spite of tireless exertions these methods have failed to influence the course of the disease. Gibson described a case of apparent cure by intravenous injections, nine in all, each of $\frac{1}{10}$ gr. of *Perchloride of Mercury*. The principal hope seems to lie, however, in a better understanding of the causes of the disease and a campaign of prevention based thereon.

REFERENCES.—¹*Brit. Med. Jour.* 1920, ii, 301; ²*Jour. of Exper. Med.* 1912, i, 330.

ENTERITIS, ACUTE INFECTIOUS, WITH A POLYNEURITIC SYNDROME.

J. Ramsay Hunt, M.D.

Farnell and Harrington¹ report a small epidemic of infectious enteritis complicated with polyneuritis, in a State hospital for mental diseases at Howard, Rhode Island, U.S.A.

SYMPTOMS.—The symptoms were ushered in by acute gastro-intestinal disturbances, characterized by nausea and vomiting and frequent discharges from the bowels containing mucus or both mucus and blood; there was a rise in temperature to 100° and as high as 104°. In a large number of the cases there was great prostration, with headache and backache. The neuritic symptoms were those of a peripheral neuritis, involving the lower or the upper extremities, and in a number of cases both upper and lower extremities seemed to be affected. In these regions there was excessive pain on slight pressure in some of the cases; in others there was pain over the muscles and nerve-trunk only on deep pressure. In several cases the fear of being touched would cause the patient to cry out, and the slightest brushing of the bed-clothes or touch of a camel's-hair brush caused excessive pain. The reflexes, especially the patellar, were absent on both sides as a general rule, but in a few cases only on one side. The Achilles reflex was absent on one or both sides. With regard to walking and the co-ordinative mechanism, there was great weakness; some could stand only with help, but could not walk. In those whose upper extremities were affected, there was a clumsiness in the use of the arms and hands. In a few cases there was a complete paralysis of the lower motor neurones of both the upper and lower extremities.

The early cases were the most severe and showed the slowest improvement. They were more uniform in their clinical manifestations after the disease process was once recognized than were the later ones. The early cases showed to a marked degree the neuritic symptoms as well as the gastro-intestinal. In the later cases the main force of the disease seemed to be exerted either on the gastro-intestinal tract or on the nervous system.

It seemed possible to divide the cases which were isolated and quarantined into three groups. In the first group were 19 cases in which the gastro-intestinal symptoms were well marked, even severe, and in which the neuritic syndrome was also especially prominent. In the second group were 7 cases in which the gastro-intestinal symptoms were serious, and in one fatal; but in which the neuritic symptoms, while unmistakably present, were so in a lesser degree than in the first group. In the third group were 21 cases in which the gastro-intestinal disturbance was the feature of the disease, only a few cases presenting slight evidences of a peripheral neuritis.

ETIOLOGY.—In this small epidemic the sudden outbreak of an acute gastro-enteritis naturally suggests that the infection must have been introduced via the gastro-intestinal tract. It therefore seemed plausible to obtain cultures from milk, which is one of the staple articles of diet in ward patients. Cultures from the milk as it came from the dairy were made, and a rapidly-growing staphylococcus made its appearance in twelve hours. Catheterized specimens of urine showed the same result in the majority of the cases examined, namely, a final growth of *Staphylococcus aureus*.

PATHOLOGY.—Autopsies were performed in four cases. Macroscopically the intestinal tract showed an acute hæmorrhagic gastritis and enteritis, the mucous membranes being deeply injected and showing small hæmorrhages throughout the mucous coat. The liver in all the cases gave indications of retrogressive metamorphosis: one showed an advanced fatty degeneration with focal necroses, and the remaining three cases indicated distinct focal necrotic areas.

Sections of the peripheral nerves and of the mid-dorsal cord showed small hæmorrhages between the nerve bundles both in the nerve itself and in the nerve-roots at their attachment to the cord. There were also noted extravasations of cells between the individual fibres.

REFERENCE.—*Amer. Jour. Med. Sci.* 1920, July, 52.

ENTEROSPASM. Benzyl Benzoate a useful remedy for (p. 6).

EPILEPSY.

J. Ramsay Hunt, M.D.

A new conception of epilepsy is formulated by P. Hartenberg.¹ In the classic view, which is now generally received, idiopathic or essential epilepsy is regarded as a convulsive neurosis, in which direct or indirect irritation of the cerebral cortex produces the clinical display of violent neuromuscular discharges; hence the terms 'aptitude convulsivante' (Joffroy), 'spasmophilie' (Féré), 'état spasmophile' (Pierret), and 'terrain convulsivant' (Mayer). These various denominations all exhibit well the primordial importance which the authors accord to the phenomena of motor irritation in convulsive troubles. Nevertheless, an impartial analysis does not, in the author's opinion, confirm this view; for there are other phenomena of which this classic conception takes no account. Such are the arrest of the psychic functions, as well as sensorial and motor: abolition of consciousness and sensation, amnesia, loss of equilibrium, transitory paralyses, etc.; which are not indicative of irritation, but rather of inhibition of the cortical centres. A careful study of the phenomena has convinced him that it is the latter group which play the leading part in the pathogeny and clinical features of the *morbus sacer*.

The greater number of epileptic phenomena, especially at first, are but features of arrest, which cannot be explained but by postulating a cortical mechanism of inhibition. Many clinical facts go to show that every arrest of the activity of the superior cerebral centres is capable of producing convulsions. The coma of asphyxia and that of poisoning are nearly always associated with convulsions. The coma of derangements of the cerebral circulation is also accompanied by convulsions—in congestion, anæmia, œdema, etc.; the same process of cerebral anæmia, therefore, by inhibition produces, in succession, unconsciousness and convulsions. Thus inhibition of the higher cerebral centres, however produced, causes discharges of muscular force. Two conditions only are necessary: the inhibition must be brusque and deep. And such precisely is found to be the case in epilepsy. Various explanatory hypotheses have been offered, but the most probable is that the inhibition suppresses the control of the superior cortical centres over the subcortical and medullary, thus emancipating the lower motorial automatisms. The phenomena are analogous to those of spasmodic laughter or weeping. Thus it would appear that the motor spasms have their origin, not in the cerebral cortex, but in the subcortical bulbar and spinal centres; for in an animal used for experiment the artificial crisis continues after removal of the cerebral cortex.

Again, the whole interparoxysmal nervous state of epileptics is in favour of the view of a diminution of the activity of the superior cerebral centres. They generally present a weakening of the faculties of attention, of memory,

and of the various kinds of sensation. Their psychical functions seem blunted. And this permanent cerebral insufficiency is possibly one of the conditions which favour the phenomena of paroxysmal inhibition.

On the other hand, the hypothesis of inhibition also explains the preponderance of nocturnal paroxysms—when we remember that sleep in itself is an arrest of cerebral activity. This conception also enables us to comprehend the balancing oscillations between the major and minor attacks. Thus it is often noticed that a crisis which does not occur after the usual interval may be replaced by a series of attacks of *absence* or vertigo, and inversely. Such facts would be incomprehensible if both minor and major attacks were not of the same nature, and dependent on the same central mechanism—that of inhibition. We can thus also conceive how an intense peripheral stimulus such as a slap on the face, a painful pinch, inhalation of ammonia, etc., can abort the onset of a paroxysm. We can suppose that the violent stimulus annihilates the cortical inhibition which would have produced a paroxysm. Thus, too, we can understand why bromides, which obviously soothe convulsions, have but a moderate effect on attacks of absence, vertigo, and their psychic equivalents, and sometimes even exaggerate them; for the sedative action of bromides on the subcortical and medullary motor cells attenuates the muscular discharges, but has no influence on the cortical inhibition, which it may even exaggerate by its depressive power.

The author finds that the old classic conception of epilepsy is at fault when examined from every point of view. Reflex irritations, visceral or peripheral, are familiar causes of epileptic paroxysms; but, according to his view, such stimulation, instead of being directly transmitted to the cortical motor cells for the production of convulsions, determines on the contrary an inhibition of the superior centres, of which those convulsive phenomena are merely the secondary consequence. Thus, according to his view, the intimate mechanism of all epileptic phenomena is that here described. All such accidents are due to inhibition of the cortical centres—psychical, sensory, and motor—a functional removal of the upper brain. The complete paroxysm is, indeed, but the unfolding of a process of cerebral inhibition, which includes the successive development of absence, vertigo, and convulsions. On the other hand, the lesser accidents constitute the early stage of an interrupted crisis. All begin in the same way, with the same premonitory signs and the same course. Thus it is not possible in practice, when the onset of an attack is announced, to foresee to what stage of gravity and violence it may attain.

The automatic accidents, the episodes of delirium, are explained by the liberation of inferior automatisms by inhibitions of the cerebral cortex; such are the hallucinations of sight and hearing, unconscious movements, somnambulistic delirium, etc. [This theory of convulsive disorders is not unfamiliar to English readers, and was enunciated many years ago by Hughlings Jackson² in his Croonian Lectures.—J. R. H.]

Essential Epilepsy as a Life-reaction Disorder.—Pierce Clark³ regards epilepsy as a disease or syndrome occurring in particular types of individuals possessed of certain instinctive or inherent defects of character or emotional make-up. Essential epilepsy is limited to that type of the disorder which is exclusive of the so-called organic epilepsies and those met with in patients suffering from definite physical lesions or dysfunctions of the viscera which secondarily induce the disease, thus leaving an apparently sound and healthy individual having epileptic attacks of apparently idiopathic origin. A life-reaction disorder is meant to embrace that type of phenomenon which may be compared to a state of rage or anger as seen in bad-tempered individuals, or excessive emotionalism as seen in the hysteric, and the like.

From ancient times the essential epileptic has been considered a peculiar type of individual. The salient features of the so-called epileptic personality are egocentricity, extreme supersensitiveness, marked emotional poverty, and rigidity of ideation and mentation. For years this character-type has been supposed to develop in direct proportion to the severity and frequency of epileptic seizures, upon which it has been assumed to depend more or less directly. Careful analysis has, however, shown that while the most glaring character faults and mental deterioration may be seen in those epileptics with frequent and severe seizures, this is by no means the invariable rule, there being many defects of instincts and evidences of severe habit deterioration in epileptics with but mild seizures. Indeed, many epileptics may undergo increasing impairment in seizure frequency and severity independent of sedatives, and yet such individuals may show by life-reactions as well as by psychological tests that the deterioration is progressive and marked.

Detailed Development of the Epileptic Character.—Inasmuch as the life-reactions of the epileptic character are the distinguishing factors of the make-up, we may sketch the defects of maladjustment at the several epochal levels of life stress. At birth the potential epileptic child frequently has periods of meaningless crying. This extra-irritability and sensitiveness is so pathological that it rarely fails of detection and record. The next important sequence in such a character is its non-pliability in being taught nursery ethics—that is, obedience and proper daily deportment in the home. These behaviour defects are usually independent of purely intellectual and physical ones, and these infants sit up, creep, talk, and walk at the usual ages. The next stressful period is at puberty; here the dissolution of the oftentimes irksome home ties may release some from the galling exactions of home discipline; but most frequently, as in the departure for school, with its exactions in deportment, it renders the puberty adjustment to work and social demands increasingly onerous. The patient often develops fugues, and tries a number of precarious jobs, often interspersed with excesses of self-indulgence. Emotionally and sexually he rarely develops beyond the level of puberty, and fails in capacity to attain adult love. Naturally this is to be expected, in that the latter demands self-subordination and sacrifice, and above all a tenderness of feeling which is conspicuously lacking in the potential epileptic. In view of the foregoing, it is evident that marriage increases demands socially as well as economically, and makes not a few potentials break out in attacks. At the threshold of life the vast majority of potentials break before or just at this period, which is the point of maximum stress.

Nature and Meaning of the Convulsion.—We know the convulsive part of the fit in its severer and cruder aspects is comparable to the impulsive movements of the infant. The impulsive foetal movements begin about the twelfth week of gestation; hence the brain cannot be involved *per se* in their genesis; further, it is known that brainless embryos possess impulses. We do not know just how the impulsive movements are incited, further than to surmise that, being of the first, simplest, and ontogenetic type of activities of the developing organism, their incitor is from motor centres of the lower order. In these latter structures is stored up a certain quantity of potential energy, which is transformed into actual energy by the blood- and lymph-stream. With the increasing tissue growth, and tension engendered thereby, this energy finds its outlet in the random movements of the foetus and the infant, and their exaggerated distorted presence is seen in the *grand mal* convulsion of epileptics.

It is thought that the essential nucleus of the epileptic fit is an infantile unconscious striving of displeasure-pleasure pursuit, ending in the final goal

of a return to infancy, attended by a loss of consciousness and a convulsion; that the convulsion is made up, and flows out, of the general striving of the fetal and infantile tissues as expressed through the lower spinal centres in inducing simple and crude combinations of impulsive movements; that a study of the degree of development of unconscious infantile strivings in the emotional instincts, the desire for an infantile state of omniscience, are paralleled by the kind and character of impulsive movements found in this infantile period of neuromuscular development.

Psychological Causes of the Loss of Consciousness.—The gradations of epileptic reactions vary from day-dreaming, lethargies, petulance, sullenness, and outbursts of impatience and temper beyond the casual, until there succeeds a series of *petit mal* attacks or a severe *grand mal*, when the lowering skies in the epileptic's life are dispelled for a time until the stresses again accumulate to an explosive level. So long as normal consciousness is maintained, the stress may work its evil consequence in ways well known to all. The epileptic reaction, from its mildest to its severest manifestation, is really a protection, for it obliterates reality and reduces the subject to the lowest level of organic response—that of a comatose state. It withdraws or reduces the subject's attachment and adjustments to reality. Thus we find, in the mild and transitory deliria of the automatic phase after *petit mal* attacks, the subject may say or do certain things which may be pieced together and minutely analyzed. Like the mental content in manic states, or drug and fever deliria, these spontaneous productions have to do with the conflicts of everyday life. Then appear the successive deeper levels of emotional strivings and conflicts.

Anaphylactic Phenomena in the Pathogenesis of Some Forms of Epilepsy.—This subject is discussed by Pagniez and Lieutand.⁴ The idea of the anaphylactic origin of epileptic phenomena is now one of old standing. The features of the epileptic paroxysm impress one with this idea by their analogy with those of the great anaphylactic shock; and various attempts have been made to establish the exactitude of this hypothesis. In certain individuals, accidents of very various types are produced by the ingestion of special aliments—cutaneous, digestive, respiratory. In these subjects, such accidents are preceded by a group of blood-vascular modifications which appear after eating, and which remind us of those which supervene in case of an anaphylactic shock. The authors subsequently showed that the ingestion of such injurious aliment in minimal doses, some time before the meal, had the effect of suppressing the clinical accidents and the *crise hémoclasique*. Such anti-anaphylactic preventive therapeutics has proved efficacious in urticaria, in the gastro-intestinal accidents of alimentary anaphylaxis, and in certain cases of Quincke's disease. It may also be applied with success in cases of migraine, and in some of asthma.

Now a certain relationship between migraine and epilepsy is extremely probable. Clinical experience also shows us an alternation, in the same subject, of epileptic crises and various cutaneous, digestive, or respiratory phenomena. The fact has also been well known that the composition of the aliments and the regularity of their administration are factors of prime importance in the existence of epileptics. The knowledge of such facts incited the authors to investigation of this question; whether the paroxysms of some epileptic cases could be truly attributed to an alimentary origin and the anaphylactic type. Prolonged supervision of some epileptics has enabled them to establish certain important facts in this connection. The observations furnish new and important data to the treasury of known facts connected with this great and extremely difficult clinical problem. At this stage they are enabled to state that, in certain epileptic cases, after the administration

of an ordinary meal important modifications in the composition of the blood may be observed. These are of a type which suggest close relationship with the phenomena of the alimentary anaphylactic order. They find that, in the course of the hours which follow development of the hæmoclastic crisis, an epileptic paroxysm tends to supervene: as if the whole clinical group—that is to say, the hæmoclastic crisis and the epileptic crisis, with their accompanying symptoms and physical phenomena—were of a well-defined anaphylactic alimentary order, which were set in motion by the ingestion of a noxious form of aliment, in presence of which the subject was placed in a state of anaphylaxis.

Epilepsy and Heredity.—P. Hartenberg⁵ states that he is in accord with other modern observers who deny the hereditary nature of epilepsy. In support of this view he cites personal statistics of 80 cases, in which epilepsy was present in the ancestors only three times. He concludes that epilepsy is not the serious family disorder that is so generally held.

Diabetic Epilepsy.—Guillain⁶ reports a case of epileptic seizures developing for the first time in a soldier in the course of acute diabetes. The seizures subsided under treatment of the diabetic acidosis, and with them the left hemiplegia which had developed at the same time. In Labbé's four similar cases the connection between the grave diabetic acidosis and the seizures was equally evident.

LUMINAL IN THE TREATMENT OF EPILEPSY.

Hauptmann,⁷ who in 1912 first called attention to the importance of Luminal in the treatment of epilepsy, reviews his later experiences with this drug. The best results have been obtained in genuine epilepsy. As a rule small divided doses are preferred to a single large dose, to avoid the hypnotic effects of the drug. Daily doses of 0.1 to 0.2 grms. may be given over long periods of time without ill effect. In cases where the attacks occur periodically, as at the menstrual period, the drug need not be given continuously, but two or three days before the usual period of the attacks. Somewhat larger doses are required in this method of treatment, which is continued over a period of five days. In certain emergencies—e.g., status epilepticus—larger doses have been given, but the author adds the warning that care should be used, as he has observed serious narcotic symptoms. In status epilepticus a sodium salt of luminal has been used, which can be given subcutaneously. Both *grand mal* and *petit mal* attacks are favourably affected.

Under certain conditions the combination of Bromide and Luminal may be considered. This has a particular advantage where a strong narcotic effect is produced by the luminal. Under these circumstances bromide is given during the day and luminal at night. Bromide and luminal may also be given alternately for periods of a month.

Luminal has also yielded good results in the hands of Maillard.⁸ The drug should be given morning and evening in cachet or tablet form, and taken with a hot liquid. The dose varies with the individual—for an adult 20 cgrms. This may, under certain circumstances, be raised to 30 or even 40 cgrms., but the patient should be carefully observed, as large doses may be dangerous. One patient, who had taken 60 cgrms. by mistake, developed prostration, weakness of the legs, and dysarthria, which cleared up promptly when the dose was reduced. During the earlier period of treatment some patients show a tendency to somnolence, and are difficult to awaken in the morning; while others manifest a slight euphoric tendency and hyperexcitability.

During the early period of treatment the patient should be seen frequently. One should also be careful not to suspend the treatment suddenly. The drug influences favourably the convulsive tendency, as well as the milder verti-

ginous seizures. After treatment has been established and the attacks have diminished, the dose may be reduced to 5 or 10 cgrms.

In fourteen cases treated, the number of attacks was reduced from 73+ to 71, and of these patients the greater number had been previously treated with bromides. Luminal not only has a salutary effect on the control of seizures, but also influences favourably the psychic symptoms of the epileptic. This favourable influence is noted on both the acute and chronic mental disturbances of the disorder.

In the discussion of this paper, de Fursac and Hartenberg noted a similar effect on the reduction of the attacks, but emphasized the exaggeration of certain mental characteristics of the epileptic—irritability, fits of anger, and even a tendency to delirium and confusional episodes.

Method of Administration.—Grinker⁹ records his experiences with luminal in the treatment of 100 cases of epilepsy. He prescribes the drug in doses of $1\frac{1}{2}$ gr., either in tablet or capsule, to be given at night before retiring. If the dose administered suffices to reduce the attacks or cause them to subside, it is given regularly in the same manner. If this dose is found to be insufficient to cause a cessation of attacks, it must be increased to 2 gr., given at night. Should this dose also prove too small, then another daily dose of luminal is added to the preceding one. In that event his rule is to prescribe a small dose, say 1 gr., to be given in the morning, while the larger dose is administered before retiring. Only rarely has he been compelled to give three daily doses of luminal; but one need not hesitate when it becomes necessary to increase the dose in order to get results. After several days or weeks, it will usually be possible to return to the smaller doses, when the effects will be as favourable as with the initial larger doses. When drowsiness and apathy appear, it is always time to reduce the dose. His invariable rule is to give as little as is necessary to keep the patient free from attacks, and no more. In cases that have been treated with bromides continuously for long periods, it is advisable to begin the luminal treatment with somewhat larger doses at first, to be reduced later. The treatment is continued for years systematically; any interruption is apt to be followed by a number of severe attacks—as with the bromide treatment.

A point worthy of mention is the experience that even moderate doses of luminal seem to exert a favourable effect on the minor attacks, while the bromides are comparatively ineffective in these conditions.

Contra-indications.—Grinker knows of no definite reasons why luminal should not replace the bromides in most cases of epilepsy requiring drug treatment. Regarding skin eruptions, he states that among 100 cases there were only two patients with rashes that necessitated a discontinuance of the luminal treatment. Urinary disturbances from luminal he has never seen, though Continental writers speak of their occurrence, and advise as a preventive measure to omit one day's treatment out of the seven. On the whole he believes that there are no contra-indications to the administration of luminal in kidney or cardiovascular conditions.

Some of his cases have been free from attacks for a period of three to four years; others from one to two years; still others, and these constitute the large majority of cases, for a number of months.

F. Bruhl,¹⁰ in charge of St. Valentinus Haus, a hospital for female epileptics, also reports favourable results with luminal. The attacks are reduced in number and diminished in severity, and the mental condition in some patients has also improved.

L. Cheinisse¹¹ reviews the literature of the luminal treatment of epilepsy. With Kress he emphasizes the importance of careful observation, especially

during the earlier period of the treatment. He also warns against the too sudden withdrawal of the drug, and the serious results which may follow (status epilepticus).

REFERENCES.—¹*Med. Press and Circ.* 1920, March 10, 192; ²*Brit. Med. Jour.* 1884, i, 660, 703; ³*Amer. Jour. Med. Sci.* 1919, Nov., 703; ⁴*Med. Press and Circ.* 1920, July 28, 68; ⁵*Presse méd.* 1920, Jan. 21, 58; ⁶*Bull. Soc. méd. Hôp. de Paris*, 1920, June 11, cxliv, M. 21 (abstr. in *Jour. Amer. Med. Assoc.* 1920, Aug. 28, 638); ⁷*Munch. med. Woch.* 1919, Nov. 14, 1319; ⁸*L'Encéphale*, 1920, July 10, 455; ⁹*Jour. Amer. Med. Assoc.* 1920, Aug. 28, 588; ¹⁰*Munch. med. Woch.* 1920, Aug. 20, 990; ¹¹*Presse méd.* 1920, Aug. 28, 598.

EPITHELIOMA, BENIGN CYSTIC, WITH XERODERMA PIGMENTOSUM.

E. Graham Little, M.D., F.R.C.P.

Withers and Coleman¹ report a very remarkable case of an association of two rare diseases in the same patient, benign cystic epithelioma of Brooke (which was fully dealt with in the *MEDICAL ANNUAL*, 1920, p. 124), and the even more rare condition known as xeroderma pigmentosum of Kaposi. The patient was a lad of 18, of German parentage, who had had the pigmented condition, black freckles on the face, neck, and hands, since early infancy, and about the age of 14 years had begun to notice the tumours, which ultimately proved to be Brooke's disease. Several of the pigmented areas ulcerated later. The only treatment adopted was the application of Radium to fourteen of the larger lesions, which are said to have disappeared in three or four weeks, leaving pink scars. There is a careful report of the histological examination.

REFERENCE.—¹*Arch. of Dermatol. and Syph.* 1920, July, 27.

ERYTHEMA NODOSUM.

E. Graham Little, M.D., F.R.C.P.

Erythema Nodosum and Tuberculosis.—Ward¹ reports five cases of erythema nodosum, in all of which tuberculosis was evident in other parts of the body. The cases include two instances of mother and daughter being attacked. In one case a girl had erythema nodosum and, ten years later, erythema induratum. (See *MEDICAL ANNUAL*, 1919, p. 151.)

REFERENCE.—¹*Brit. Med. Jour.* 1919, ii, 811.

EXOSTOSES, BENIGN.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Bony growths in this form have long been associated with some nutritive change, and arise at the epiphyseal end of a growing bone. They also undoubtedly follow trauma in the nature of long-continued friction, such as is seen at or near the inner surface of the lower epiphyses of the femur of horse-back riders. Exostoses which arise from the growing epiphyseal line are found subsequently at some distance from this portion of bone, for the actual point of origin of the growth remains stationary while the epiphyseal cartilage proper recedes. Sometimes a very small subperiosteal hæmatoma proves the starting-point of an actively growing exostosis; this cannot be distinguished from the exostosis arising from continued and repeated friction. Elliot¹ describes a case illustrating the occasional rapidity of growth arising in this manner.

REFERENCE.—¹*Ann. of Surg.* 1920, Aug., 228.

EYE DISEASES, FOCAL INFECTION IN RELATION TO.

J. Burdon-Cooper, M.D., D.O.

Bell,¹ in a paper read before the American Medical Association (Ophthalmological Section), reviews and groups the chief focal infections encountered in the practice of ophthalmology. He calls them the three T's—teeth, tonsils, toxæmia of the intestine. He urges the great importance of attention to the teeth early, so as to avoid abscess formation. Deep-seated and hidden

foci of oral infection are the most virulent, and can only be revealed by the roentgenogram. Diseases of middle life, he thinks, are fast increasing, and mouth and diet are the source of greatest danger; he advocates routine tonsillar examination, and as the tonsils are not only receptors and transmitters of many infectious processes, but the principal foci of infection in throat carriers of hæmolytic streptococci, nothing short of radical treatment is of any value when they are diseased. In the words of Professor Osborne, of Yale, focal infections of teeth, tonsils, and alimentary canal are no fads, but realities to be looked for and eradicated if we are to cure our patients. Errors of diet, pyorrhœa alveolaris, undue use of sugar, are, according to Bell, the starting points of hyperacidity and toxæmia, and he is brought to the conclusion that the unrestricted use of carbohydrates must be deleterious to the human economy. Sugar has been found in the vitreous, aqueous, and lens. Why may it not produce inflammatory processes in any of the eye tissues? He mentions a case of obstinate scleritis cured by the removing of the pyorrhœa which caused it.

In the discussion which followed, Woods pointed out a similar case in which all the teeth except four were removed without a cure resulting, showing that there may be more than one cause. Wholesale removal of tonsils or teeth is a diagnostic pitfall. Before resorting to such treatment, every other cause should be investigated and bacteriological examination of tonsillar crypt contents made. Recurrent phlyctenular ophthalmia is associated with intestinal disorders. Weeks concurred in elimination or limitation of the quantity of sugar. Park Lewis found that a recurrent iritis was due to the *Str. viridans* isolated from a root abscess, and produced iritis in a rabbit by injecting a culture, the organism being found in the iris tissue. Veasey related five cases of ophthalmoplegia interna due to tonsillar and teeth infection. He has also observed several cases of high blood-pressure associated with retinal arterial pulsation, hæmorrhages, and acute nephritis in which these conditions disappeared on removal of the focus of infection. Rose justly remarks that every inflammation, from the top of the head to the sole of the foot, makes greater headway in an acid body; for this reason he stops all sugar, fruit, and alcohol, limits protein food, administers bicarbonate of potash and soda, and recommends routine blood-examination in degenerative eye diseases. Tiele points out that a positive Wassermann does not mean that an iritis is due to syphilis. Brown and Irons found, in 100 cases of iritis, that 17 cases were due to combined causes. Regarding intestinal toxæmias, the view at present held seems to be that these are due to the same focal infection as the iritis. Professor Lewis some time ago, speaking on the etiology of lenticular changes, stated that every patient presenting such a condition of the lens was suffering from intestinal toxæmia. King, of New York, mentions an interesting case of a medical man who developed episcleritis, multiple arthritis, nephritis, myocarditis, and endocarditis three weeks after severe tonsillitis. He found a virulent infection of the tonsils, and used an autogenous vaccine; all the symptoms disappeared in a month. Zeigler emphasizes the importance of suboxidation.

Terson² states that almost all infections of the eye have a number of factors; even in specific cases, general and occasional causes co-operate to produce the morbid condition. In certain cases of iritis and choroiditis no treatment seems effectual till the teeth are put in order, and disease of the liver, urethra, or uterus treated. Sometimes a brisk purge will be followed by complete subsidence of a stationary conjunctivitis. Dianoux reports the curative effect of acetylsalicylic acid in typical syphilitic iritis. Terson regards acute glaucoma as a process identical with that of acute œdema of the lung. It induces hyper-

tony, because the means for excretion or exosmosis are so scanty. General pathology thus explains and identifies glaucoma. Conedic reported a case in which glaucoma alternated with arthritis, and then there was an attack of oedema of the lung.

Webster Fox³ writes on *the relation of general arteriosclerosis to the eye*, concluding that it is the ability to use the ophthalmoscope and interpret the picture it presents which constitutes the relation.

Luther Peter,⁴ writing on *the eye in pregnancy*, concludes that the fundus changes in the nephritis of pregnancy of any type are as a rule definite and concise. Fundus studies should therefore be part of a routine study in pregnancy when uranalysis and blood-pressure phenomena show an abnormality of kidney function.

Wood⁵ finds that, in focal infections of the eye, the uveal track is mostly affected. As a rule the infection is chronic and of low virulence, and produces no effective symptoms; there may be more than one focus having etiological bearings on the condition at the same time. The commonest locations are the mouth, teeth, throat, middle ear, mastoid, and other mucous membranes. The commonest organisms are the streptococcus, pneumococcus, and gonococcus.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, Oct. 11, 1127; ²*Paris méd.* 1919, No. 36, Sept. 6; ³*N. Y. Med. Jour.* 1919, Dec. 20, 1021; ⁴*Ibid.* 1920, Jan. 24, 141; ⁵*Jour.-Lancet*, 1919, xxxix, 365.

EYE, ENUCLEATION OF, AND ITS SUBSTITUTE OPERATIONS.

J. Burdon-Cooper, M.D., D.O.

J. E. Weeks and A. Greenwood¹ give a general review of this subject. Enucleation was first performed by Bonnet² in 1841, being based on his studies of Tenon's capsule. The operation needs no description, being well enough known. Substitute operations are of two classes: (1) Those in which the globe is removed entirely, its place being taken by some substitute placed in Tenon's capsule at once or later; (2) Those in which some portion of the eyeball is retained (*a*) without implantation, and (*b*) with implantation.

To the first category belong the following operations: Filling Tenon's cavity with paraffin—Suker,³ Ramsey,⁴ Spratt⁵; (ii) Turning in a piece of skin from the lower lid—Maxwell⁶; from the temple—Cross⁷; inserting glass or gold sphere—Frost⁸; the eye of a rabbit—Chibret⁹; a mass of fat—Barraquer¹⁰; a circular piece of skin and fat from the deltoid region—Rollett¹¹. Balls of wire, silver, rubber, bone, elder, costal cartilage, have been used. Fat, glass, gold, and cartilage produce the best results.

To the second category belong opticociliary neurectomy—Boucheron¹²; anterior amputation with retention of part of the contents of the globe—Critchett,¹³ Lagrange¹⁴; evisceration, incising the cornea and wiping out the contents of the globe—Noyes¹⁵; excision of the cornea and ciliary zone, and removing contents of the globe—von Graefe,¹⁶ Ahlstrom and de Lapersonne.¹⁷ Nicati¹⁸ excises the posterior third of the eyeball, removing the contents and preserving the anterior two-thirds, including the cornea. Gifford¹⁹ retains the entire cornea and sclera and removes the contents. Huizinga²⁰ removes the anterior portion of the globe as in Mules' operation; he makes the long diameter of the opening horizontal, excising a circular portion of the sclera, with optic nerve and ciliary nerves, at the posterior pole, and removes the contents of the globe; an artificial vitreous may or may not be used.

The insertion of an artificial vitreous includes Mules'²¹ operation, in which gold or glass balls are used of a size small enough to admit of suturing the sclera opening without pressure on them, and Barraquer's modification, in

which a mass of fat from the gluteal region is used instead of the metal. Dimitry²² has modified Huizinga's operation, excising the cornea and ciliary zone, eviscerating, removing a disc of sclera including the optic and short ciliary nerve behind, and, after removal of all traces of the choroid, inserting a gold ball into the scleral cavity, suturing the sclera over it. The conjunctiva is sutured to Tenon's capsule where it joins the sclera, but is not drawn over

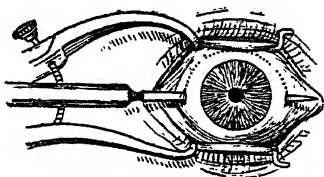


Fig. 21.—Transfixion with Graefe knife.

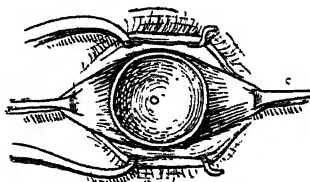


Fig. 22.—Anterior segment excised and scleral cavity emptied.

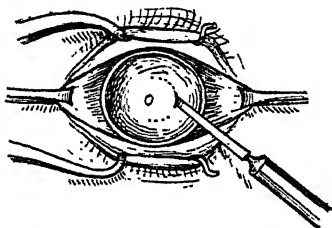


Fig. 23.—Cutting window in back of sclera.

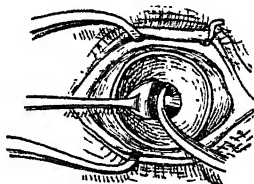


Fig. 24.—Dividing optic nerve.

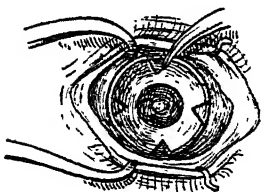


Fig. 25.—Cutting triangles out of sclera.

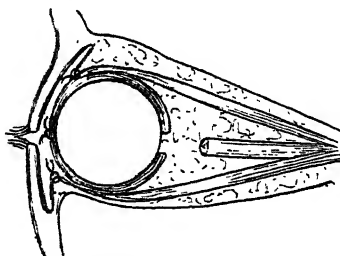


Fig. 26.—Schematic section showing gold ball inserted—window in back of sclera—optic nerve cut—conjunctiva sewed to Tenon's capsule, not over sclera.

Figs. 21-26.—DIMITRY'S OPERATION IN EVISCERATION OF SCLERA.

the sutured sclera, so as to admit of greater range of movement of the prosthesis. Morax inserts cartilage into the scleral cavity; he preserves it in 10 per cent formalin solution, soaks it in alcohol to remove formalin, and then in water.

Of the substitute operations, the most commonly practised is the implantation of an 18- to 22-mm. glass sphere into Tenon's capsule, suturing the muscles over it, and finally the conjunctiva, suturing the latter at right angles to the palpebral aperture. Where evisceration is performed, Dimitry's operation is a good one. Figs. 21-26 give a good idea of how it is carried out. He

claims for its absence of injury to the sympathetic, preservation of normal movements, a good foundation for prosthesis, no greater risk than enucleation, sympathetic iridocyclitis eliminated better than in other operations. Instead of suturing the muscles over the ball in Tenon's capsule, Verhoeff cuts the insertion of the muscles, and closes Tenon's capsule over the ball by means of a double armed silk suture, the ends of which are tied over a pearl button.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1920, April, 410; ²*Ann. d'Oculist.* v. 27; ³*Internat. Ophthalmol. Cong.* 1900; ⁴*Ophthalmic Rev.* 1903, July; ⁵*Arch. of Ophthalmol.* 1905; ⁶*Ophthalmic Rev.* xxii, 121; ⁷*Trans. Ophthalmol. Soc.* xviii-xix; ⁸*Middlemore Prize Essay.* 1885; ⁹*Rev. gén. d'Ophthalmol.* 1909, 377; ¹⁰*Internat. Med. Cong.*, Madrid, 1903; ¹¹*Clinique ophtalmol.* 1904, 377; ¹²*Gaz. méd. de Paris*, 1876; ¹³*Moorfields Reports*, iv; ¹⁴*Ann. d'Oculist.* cxxvi, 369; ¹⁵*Fourth Ophthalmol. Cong.*; ¹⁶*Natur. Versamml.*, Magdeburg, 1884; ¹⁷*Arch. d'Ophthalmol.* xx, 289; ¹⁸*Ibid.* xxii, 347; ¹⁹*Ibid.* xxii, xxix; ²⁰*Jour. Amer. Med. Assoc.* 1900, Feb. 17; ²¹*Trans. Ophthalmol. Soc.* v, 200; ²²*Amer. Jour. Ophthalmol.* 1910, Sept.

EYE, GENERAL AFFECTIONS OF. (See also CATARACT; CONJUNCTIVA; GLAUCOMA; RETINA.) J. Burdon-Cooper, M.D., D.O.

Disturbance of Balance of Ocular Muscles.—Marlow¹ writes on the influence of prolonged monocular occlusion in revealing errors in the muscle balance. His paper should be read in the original. From it we cull the following:—

The length of time ordinarily devoted to tests for muscle balance is insufficient for the purpose. It is difficult to say how long a period of occlusion is necessary to bring out the error fully. This may (according to the charts exhibited) be a week or even more. The results obtained by the usual brief manner of applying muscle tests may be misleading not only as to degree but also as to kind of error, a striking phenomenon being the reversal of the direction of deviation. Thus a right hyperphoria before occlusion may become a left hyperphoria afterwards, the change commonly being accompanied by the development of exophoria; or most commonly an esophoria changes to an exophoria; or both changes may be seen in the same case; the most frequent change, however, is a great increase in the degree of deviation.

Numerous observations by the occlusion test completely disprove any constant relation existing between the prism duccion and deviation. Exophoria after prolonged occlusion often greatly exceeds abduction as measured before the test. The effect of any operation on the muscle balance cannot be determined with certainty without the occlusion test, the effect of prism exercises being to obscure or render latent an error previously manifest. It appears that the test brings out conditions which make it unnecessary to assume that the continuous use of the prism tends to increase an error, far greater and more rapid change being produced by the passive relaxation occasioned by the occlusion test. The paralytic and non-paralytic character of a hyperphoria can be determined with much greater ease after than before the test.

The theory held by some that lateral deviations are secondary to vertical receives no support from the occlusion test, so far as exophoria is concerned. In some cases of esophoria, however, the convergence disappears or is converted into divergence coincidentally without increase in the degree or change in the form of hyperphoria.

Miner's Nystagmus.—This disease is at last receiving the attention that its industrial importance demands, and much has been done within the last decade. Its chief factor is a rapid oscillation of the eyes. The symptom is, however, seen in other conditions and is common in defects of the eyes arising from congenital malformation or acquired disease, and occurs in certain diseases of the nervous system and of the ears. It is now thought that the chief cause is bad light; and the problem is to secure suitable illumination.²

Dacryocystitis.—Green reviews the literature on the various surgical

procedures that have been offered in recent years for the treatment of this condition, and summarizes his conclusions as follows :—

1. A combined operation of curettage followed by immediate rapid dilatation removes any foreign material lodged in the canaliculi, lachrymal sac, and ducts.

2. If polypi or granulation tissue are present in any part of the duct, they are effectually removed by this method of curettage.

3. Thus prepared, the duct readily admits large probes (Theobald 11 to 12), and may be dilated up to 13 to 16 at the first sitting, thus ensuring adequate primary and secondary drainage.

4. The application of tincture of iodine to the mucous surface after curettage and dilatation by probes stimulates it to normal activity and regeneration. If pus should re-form, the operation can be readily repeated. It can be done in the consulting-room; and should it fail the sac can then be extirpated.

The Cornea.—Major Kirkpatrick³ describes a form of *macular keratitis* which has recently been epidemic in Madras; it resembles the superficial punctate type, but differs in being more macular than punctate. The lesion is situated in the superficial layers of the substantia propria, or Bowman's membrane, and the deeper layers of the corneal epithelium. It occurs in three types (*Plate XIX*): (1) A superficial keratitis with discrete spots dotted irregularly over the surface; (2) As a large patch, the punctate character being absent; (3) As a large single spot. The author says it is rare for the disease to attack more than one eye. The opacities are slow in clearing, and the process is variable. It has been met with in all classes of the population, the patients have apparently had good health, and there is no association with general disease. He presumes the cause to be either parasitic or nutritional, and probably protozoal.

The Iris.—Browning⁴ writes on the radical cure of *gonorrhœal iritis*. He considers it a toxic condition and not due to the presence of the gonococcus in the eye. He thinks the preventive treatment rests with those who see the gonorrhœa in its early stages. Examination should be undertaken by a specialist in genito-urinary work, and by a bacteriologist familiar with the examination of urine after massage. If such were the case, there would be no gonorrhœal iritis. As radical treatment, he suggests immediate treatment by the ophthalmic surgeon, continued treatment by vaccines and prostatic and vesicular massage, with treatment of the urethra if necessary.

Inglis Pollock⁵ writes on the *action of hypothesin on the pupil*. Hypothesin applied to the rabbit's eye produced mydriasis in 94 per cent of the experiments; the effect was increased by decentralization, and still more by deganglionation of the dilator pupillæ or of the sphincter pupillæ, and most markedly by deganglionation of dilator and sphincter. Given intravenously, the local mydriatic effect is lost if the blood-pressure is raised, when a miosis occurs through central stimulation of the third cranial nerve; the miosis relaxing with the return of the blood-pressure to normal—as shown for adrenalin in the dog by Elliot—and being followed generally by slight dilatation. The constriction of the pupil may be preceded by a brief dilatation due to excitement at the moment of injection. Excision of the ciliary ganglion or section of the third nerve above it causes the pupil to dilate within a few minutes of the injection. Hypothesin acts on the same structure as adrenalin, and since adrenalin acts on the neuromyal function, hypothesin must act similarly.

The Lens (see also CATARACT).—Schweinitz and Wiener⁶ describe a case of the rare anomaly known as *anterior lenticonus*, only two cases of which are on record, one by Webster⁷ and the other by Van Laan.⁸ In the case under review, the lens showed a pronounced anterior cone protruding

PLATE XIX.

MACULAR KERATITIS



Intermediate between Type I and Type II.

Type I.

Type II.

Type III.

By kind permission of the 'British Journal of Ophthalmology'

into the anterior chamber, seen most distinctly when viewed from the side. Its tip nearly touched the posterior surface of the cornea. Both lenses were small and slightly hazy. As is well known, examinations of posterior lenticonus have usually demonstrated a rupture in the posterior capsule and displacement back of the nucleus. The discovery of this condition—i.e., anterior lenticonus—seems to have antedated that of posterior lenticonus first made by Meyer in 1888. Verhoeff suggests that it may be due to the persistence of the conical shape of the embryonic lens vesicle, and delayed separation of the lens from the cornea.

Maynard⁹ finds that great variations in weight and volume are found both in European and Indian lenses, and that in Indian cataracts the ash is very small and varies considerably. Cataracts in Indians are lower in weight and greater in volume than in Europeans, and also show a steady increase in weight and volume as they ripen and pass on into over-ripeness. Priestley Smith's statistics show that cataractous lenses are lighter and of smaller bulk than clear ones.

The Vitreous.—Hausell,¹⁰ in a paper on *tumours of the vitreous*, states that the diagnosis between malignant and non-malignant tumours still presents considerable difficulty. Diagnosis is of the greatest importance in the early stages, when enucleation will prevent metastasis. Accurate observation in the course of the detachment—measuring the visual field—is extremely helpful; a gradually increasing area of blindness almost positively indicates tumour, whereas fluctuations point to other causes. It should be borne in mind that only when the normal relation between secretion and excretion is altered does the tension increase. Plus tension then in the case of tumour is not primary, but secondary to want of balance between secretion and excretion. Transillumination has its greatest diagnostic value in tumours of the anterior half of the eye-ball, and the reflex should be studied from every direction. Hausell considers that the fear of metastasis is exaggerated.

Schweinitz and Wiener¹¹ describe a case of *cysticercus of the vitreous*. In this case the left eye was involved and was blind five months before the patient came under examination—blurred vision being noted ten months previously. There were no gross changes in the iris, but a few punctate deposits on Descemet's membrane and a few spots on the anterior capsule of the lens. The vitreous was cloudy, with a few fixed vitreous opacities. There was a grey reflex in the upper and inner quadrant, and a large globular mass in the central field of the vitreous well in advance of the macular region; the outline of this was regular, the border translucent, and from the lower edge protruded a tubular extension, transversely wrinkled, which terminated beyond a constricted neck in a head showing two bright dots—the position of the hooklets. Peristaltic movements and movements of the head were very active at times. The diagnosis of *cysticercus of the vitreous* was readily made. The general examination of the patient revealed little except that the stools contained ova but no segments of the worm. Operation was undertaken. After incising the conjunctiva between the external and inferior rectus parallel to the corneal margin, the sclera, choroid, and retina were perforated longitudinally to the extent of 1 cm. Fluid vitreous escaped. Forceps were introduced and the cyst grasped, when it ruptured promptly. Further efforts were not made, and the wound was closed. The eye remained quiet, but the lens became cataractous. Twenty-eight days after operation the eye became painful and there was a severe iritis, and enucleation was advised.

According to Ward, three different species of tapeworm larvæ occur in the eye—*Tania solium*, *Tania echinococcus*, and the bothriocephaloid tapeworms; the first is the most common,

Injuries to the Eyes.—Routine examination of the eyes of wounded men has often revealed elaborate retinochoroidal and vitreous changes, with no external manifestations of injury, as a result of *concussion injuries*. Bonnet has explained these conditions as due to the driving of the blood column into the small vessels, this force rupturing them and causing varying degrees of injury. In severe concussion with *commotio retinæ*, vision may be lost for several days, and prolonged hypotony may occur. Marked reduction of vision, however, does not necessarily indicate perforation of the globe. A concussion causing an ipsilateral lesion is probably prevented from affecting the other eye by the accessory sinuses, which do not transmit the shock. There is a striking analogy between eye and brain concussion injuries.

Morax's¹² conclusion, after the examination of three cases of *injuries to the eye from high-voltage currents*, are that, following accidental electrocutions, there supervene signs of iridociliary inflammation, preceding or accompanying the lens changes. The first signs begin from ten days to three months after the accident. The lens opacities which occur vary considerably in their time of onset, from one month to even as many as seven. No opinion is expressed as to whether the changes are due to the electric current itself or to the luminous rays which are a feature of short circuits. These cases are of some medico-legal interest, the difficulty being whether the sequelæ of iridocyclitis and of lens lesions are the outcome of the accident or are to be attributed to endogenous infection.

REFERENCES.—¹*Brit. Jour. Ophthalmol.* 1920, April, 145; ²*Brit. Med. Jour.*, 1920, Feb. 14; ³*Brit. Jour. Ophthalmol.* 1920, Jan., 16; ⁴*Ibid.* March, 102; ⁵*Ibid.* 106; ⁶*Jour. Amer. Med. Assoc.* 1919, Oct. 18, 1187; ⁷*Arch. f. Augenh.* iv, 262; ⁸*Jahrb. f. Ophthalmol.* ii, 369, 380; ⁹*Brit. Jour. Ophthalmol.* 1920, Feb.; ¹⁰N. Y. *Med. Jour* 1919, Aug. 30, 372; ¹¹*Jour. Amer. Med. Assoc.* 1919, Oct. 18, 1187; ¹²*Ann. d'Oculist.* 1918, July.

EYE GENERAL THERAPEUTICS OF.

J. Burdon-Cooper, M.D., D.O.

Key¹ speaks favourably of Antidiphtheritic Serum in severe ocular infections, especially *hypopyon keratitis*, and its benefit on the general systemic condition. The injection was supplemented by fomentations of bichloride of mercury 1-5000, atropine, and, when necessary, hot saline irrigations.

Injections of sterilized Cow's Milk, introduced by Müller and Thanner, of Vienna, have been used successfully by Mansilla² in many ocular affections—acute iritis, infective ulcers of the cornea, post-operative infection, purulent ophthalmia, trachoma, eczematous keratitis. Local treatment for the respective conditions should be employed in addition. Darier³ endorses the value of this method in gonorrhœal complications, rheumatism, etc., and finds the milk and serum treatment most useful. Gaupillet uses Domec's intramuscular injection of cow's milk.

Betti⁴ reports two cases of panophthalmitis due to *B. coli* following a contusion of the eye and dacrocystitis, the latter having been noted before by others. [The *B. coli* gives rise to a quite typical ulceration of the cornea, extremely prone to relapse and very intractable. A Vaccine offers the best hope of rapid cure.—J. B.-C.]

For acute and exuberant *trachomas*, Gerard⁵ uses Oxidized Naphthol Camphor, supplemented by Iodine and Zinc Chloride (see CONJUNCTIVA).

Javorides⁶ recommends Rohmer's Auto-serum method of treating certain *inflammatory diseases of the eye* (hypopyon keratitis, corneal infection from foreign bodies, post-operative infections in cataract), injecting the serum from a blister on the patient's body, that from young subjects being more efficacious than from the aged and debilitated.

Aguizy,⁷ for *infected ulcers of the cornea*, uses subconjunctival injections of

5 to 10 drops of **Perchloride of Mercury** as near the ulcer as possible, supplemented by the usual means, heat, atropine, and antiseptics.

For *detachment of the retina* (myopia 8 D), Martin⁸ punctured at the side of the detachment and injected subconjunctivally **Salted Gelatinized Serum**, combined with rest and pressure bandage. Contrary to Deutchmann, he recommends immediate puncture.

Dor (Lyon)⁹ reviews the work of others on '**Krysolgan**' (the monocyanide of gold ethylene diamine cantharidine containing 50 per cent of gold) in *tuberculous diseases of the eye*. Schnaudigel considers it a specific, its action being comparable to tuberculin; cases of chronic uveitis are those most favourably influenced.

For the use of **Magnesium Sulphate** in *diseases of the conjunctiva and cornea*, see CONJUNCTIVA.

Sir Arnold Lawson¹⁰ has a useful article on **Flavine** in ophthalmic surgery. There are two derivatives of the compound diamino-acridin, the methylchloride of diamino-acridin, or acriflavine, and the hydrochloride, or proflavine; they are both non-toxic antiseptics. A 1-1000 solution in normal saline was employed, and the experience related to wounds and inflammatory conditions. It is pointed out that flavine is an antiseptic rather than a disinfectant, and ought to be used to prevent sepsis rather than cure it. In regard to wounds caused by foreign bodies and operations requiring sutures, the author states that he has not met with a single case coming under early treatment which has given rise to trouble from sepsis when flavine has been employed. He speaks equally favourably of it in operations on dirty eyes and in those operations which require sutures—a 1-1000 solution used at the time of operation and two days afterwards. In grafting, he swabs the surface to be grafted with 1-1000 solution after bleeding has stopped, and lays strips of gauze soaked in flavine over the graft, the dressing being undisturbed for several days. In Thiersch grafting he prefers a weaker solution, 1-4000. As regards inflammatory affections, flavine is not to be relied on. The author suggests it might be used in *ophthalmia neonatorum* in place of silver nitrate; he recommends a solution of 1-4000. It may be used to wash out the anterior chamber in *hypopyon keratitis*.

Wolff,¹¹ in an interesting communication on *scrofulous ophthalmia*, apologizes for retaining the term, which conveniently classifies cases which at some time or other have presented a tuberculous inflammation. This may have been cured by the natural powers of resistance, but the eye has been rendered hypersensitive to the tuberculous toxin. He considers that tuberculous poisons are now and then mobilized out of tuberculous inflamed glands, and the eye, previously rendered ultra-sensitive by these toxins, is thus affected. Treatment should aim at removal of the tuberculous foci generating the toxins, and at decreasing the sensitivity of the eye. Removal of glands by operation is not altogether satisfactory. [We can endorse this view, as we have now a patient under our care where miliary phlyctenulæ developed in both eyes after the removal of a tuberculous cervical gland on the right side.—J. B. C.] Wolff recommends the exposure of the lymph-glands of the head and neck to α rays first filtered through an aluminium plate 5 mm. thick, secondary rays being excluded by means of felt. For local treatment he uses **Silver Fluorescein** (soluble to the extent of 2 per cent in water) as a 5 per cent salve in white vaseline, applied every hour. Zinc fluorescein, so useful in diplobacillary conjunctivitis, is of little use in aggravated phlyctenular inflammation, where in all probability staphylococci are the greatest offenders.

Under the title of the new therapeutics of *trachoma*, Sculco¹² describes an entirely new method of treating this troublesome complaint. The active agent

is a chemical ferment extracted from *Nepeta cistriodora* which has a definite parasitotropic action on the infective agent of trachoma. It is neither toxic nor caustic, and produces no reaction in a healthy conjunctiva or in other conjunctival inflammations. It acts in the phase of maturity of trachoma, but has no action in the advanced cicatricial degenerative stage. It acts apparently on the cause and spares the tissues. The length of time for cure is about forty days, though the patient should remain under observation for six months in case of relapse. The method of using the material is rather specialized, and those interested should consult the original article. Samples will be sent free to oculists who ask for them. They should write in the first place to the Editor of the *Clinique Ophthalmologique*. The price for a box of ten treatments is 22 francs.

Diavoux, of Paris,¹³ in an article on *Aspirin* in *syphilitic iritis*, suggests, from a very favourable experience in one case in which he gave 3 grms. in one dose, that the drug may be an antisyphilitic. His observation is certainly worth investigation.

Those interested in *Vaccines* in ocular therapeutics should read an article on the subject by Darier.¹⁴

The therapeutics of *Radium* have made great advances. It is now possible to determine and administer a dose almost as accurately as with ordinary drugs, and judging from Terrien's¹⁵ paper the dangers of radiotherapy to the normal eye have been exaggerated. Lapersonne and Degras, of Paris, report three cases of treatment of tumours of the lid by radium (one an angioma, and the other two apparently rodent ulcer), with very satisfactory results.

Arruga¹⁶ (Barcelona), in a paper on *Salvarsan* and its derivatives in the treatment of *sympathetic ophthalmia*, concludes from the treatment of seven cases that the action of salvarsan as a therapeutic agent is extremely favourable in the vast majority of cases. It shows up best in grave and advanced cases. Anything that offers a more favourable prognosis than now maintains in that terrible disease is worthy of consideration.

Weeks¹⁷ paper on the use of *Tuberculin*, written for the purposes of discussion, elicited valuable information. In answer to the question in what cases of eye lesion tuberculin should be given, we are told: (1) All cases where a local reaction is excited by the injection of a test dose. Weeks uses $\frac{1}{2}$ mgrm. in children and 1 mgrm. in adults. Byers considered 1 mgrm. too high for an initial dose. (2) Suspected tuberculosis in which (a) general reaction to tubercle has been obtained, and (b) benefit has accrued from therapeutic doses. Weeks uses old tuberculin as supplied by the New York Board of Health in almost all cases. When improvement ceases, he resorts to T.R. and B.E. The dose he employs is that just short of producing a systemic reaction, repeated every four or five days, continuing the injections for two months after all signs of activity have subsided. Risley mentioned a case of gumma of the orbit which tuberculin seemed to cure. Davis preferred old tuberculin, Jackson (Denver) likewise, both for treatment and diagnosis. Woods spoke of fresh mischief in the fundus being started by tuberculin, and Jackson in three separate cases saw fresh fundus hæmorrhages follow its use. Verhoeff had given it up as a therapeutic agent, resorting to hygienic measures.

Dor¹⁸ uses *Calcium Chloride* 4 grms., *Sodium Iodide* (dry) 4 grms., *Distilled Water* to 300 grms., as a bath for *cataract*. It should be used twenty minutes every day for three months, then for two months out of three, then for one month out of three for the remainder of life. The treatment is based on the hydration theory proposed by the late Henri Dor. Special stress is laid upon attention to the stomach and teeth, removing all the upper molars affected by periostitis.

Savineau¹⁹ writes on *Antigonococcic Vaccine* in the complications of *blennorrhagia*.

Darier's²⁰ paper on *biological methods of treatment*, and Raymond's²¹ on *serum therapy in influenza*, are both interesting and instructive communications.

Employment of Iodine in ophthalmic practice (*see p. 18*).

REFERENCES.—¹*Arch. of Ophthalmol.* 1919, xlviii, 581; ²*Med. Ibera*, 1920, iii, 17; ³*Clinique ophtalmol.* 1919, March; ⁴*Riforma Med.* 1919, Sept. 13; ⁵*Ann. d'Oculist.* 1919, Dec.; ⁶*Ophth. Soc. of Egypt.* 1919, 80; ⁷*Ibid.* 185; ⁸*Clinique ophtalmol.* 1920, Jan.; ⁹*Ibid.* 1919, Dec.; ¹⁰*Lancet*, 1919, June 28; ¹¹*Brit. Jour. Ophthalmol.* 1920, Feb.; ¹²*Clinique ophtalmol.* 1919, Feb.; ¹³*Ibid.*; ¹⁴*Ibid.* April; ¹⁵*Arch. d'Ophthalmol.* 1919, May-June; ¹⁶*Espano Oftalmologica*, 1919, Aug.; ¹⁷*Trans. Amer. Med. Soc.* 1918, 114; ¹⁸*Clinique ophtalmol.* 1919, June; ¹⁹*Ibid.* Aug.; ²⁰*Ibid.* Oct.; ²¹*Lyon méd.* 1919, March.

FÆCES, EXAMINATION OF.

O. C. Gruner, M.D.

The examination of the fæces should be considered as important as that of the urine. The steps of the examination are: (1) Microscopical; (2) Bacteriological; (3) Chemical—search for blood, soluble 'albumin', and stercobilin. The examination is directed towards ascertaining whether there is: (a) Disease of the intestine itself—(i) functional, (ii) organic; (b) Disease of the pancreas; (c) Freedom from infection after typhoid, dysentery, etc. If there are intestinal symptoms without evidence of intestinal disease, it leads the inquirer to search other systems, and also the stomach (test-meal).

Microscopical Examination.—*Functional disease*: excess of meat fibres, large numbers of starch grains, fat crystals in an alkaline stool, proportions of the coliforms in film preparations. *Organic disease*: pus cells, virulent parasites, tubercle bacilli.

McDonald¹ has studied the flotation method of examining fæces for parasitic ova. A large faecal sample is thoroughly mixed with concentrated brine; the material which first comes to the top is forced down with a special steel disk, and the final scum is looped off with wire loops, half an inch in diameter, an hour later. The material is examined on a slide without a cover-glass. This enables the ova of intestinal worms to be detected easily. But McDonald finds that it fails to demonstrate all operculate ova. He finds that such small ova are easily ruptured by the brine and do not float. Hence the customary procedure of using original fæces is necessary.

Chemical Examination.—

Occult Blood.—Pern² makes a thin smear of fæces on a microscopic slide, adds 2 to 3 drops glacial acetic acid, spreads evenly with a wooden match, and then warms over the flame. A drop or two of benzidine dissolved in alcohol is added, and finally a drop or two of H_2O_2 . A dark blue appears almost immediately.

Cooke³ recommends Meyer's test, and, if this is positive, controls by Weber's guaiacum test, as the first is ultra-sensitive. *Meyer's test*: Milk diet for a few days. Fill a test-tube one-third full with a thick emulsion of fæces; add one-third of this volume of acetic acid, mix, boil, cool. Then add 5 c.c. ether. Invert several times. Pipette off the supernatant fluid. Add 1 c.c. of the reagent and a few drops H_2O_2 . An immediate red means blood. (The reagent is: phenolphthalein 2 grms., anhydrous potash 20 grms., distilled water 100 c.c.; then add 10 grms. of zinc powder; boil, to get a colourless solution; if not quite colourless, add a little more zinc; filter while hot; keep in the dark with a little zinc powder in the bottom of the bottle.) *Weber's test*: To the ether extract of the above process add 8 to 10 drops tinct. guaiaci and a like amount of H_2O_2 . A blue within two minutes means blood. The stool should be examined on different days before pronouncing finally negative.

Soluble 'Albumin'.—Cooke uses this test as well, although it is practically

always present when blood is present. It may be found apart from blood in cases of sprue, tuberculous enteritis, and carcinoma. That is, it is almost always associated with some serious condition. It is only rarely that it means simple failure of digestion.

To detect the position of the lesion made out by these tests, Cooke proceeds to do a lavage ($\frac{1}{2}$ to 1 litre of warm saline), and examines the fluid so obtained both for blood, soluble 'albumin', and microscopically.

Stercobilin.—Brulé and Garban,¹ in a careful analysis of the existing knowledge about this substance, show that it is not possible to make an exact estimate of the amount of stercobilin in the stool. Hence, existing ideas about the physiology of urobilin are based on fallacious data. The chief practical bearing is that one cannot diagnose a complete obstruction of the bile-duct upon absence of stercobilin in the stool, nor, when stercobilin is found, can one conclude there is only a partial obstruction of the duct. A certain amount of the stercobilin of the fæces is not derived from the bile-pigment at all, and some of this is excreted direct from the blood by the intestinal epithelium. Stercobilin and stercobilinogen are not the terminal stages of the disintegration of bilirubin, but simply stand for one of the stages of this, and may become transformed into other little-known pigments.

It is to be noted that a colourless stool may still contain large amounts of stercobilin. In such cases the fæces are saturated with ammonium persulphate mixed with amyl alcohol, and the fluorescence test with 0.1 per cent zinc acetate is carried out on the filtrate.

REFERENCES.—¹*Jour. of Lab. and Clin. Med.* 1920, March, 386; ²*Med. Jour. of Australia*, 1920, June 5, 525; ³*Lancet*, 1920, ii, 291; ⁴*Presse méd.* 1920, June 16, 393.

FAMINE DROPSY. (See DEFICIENCY DISEASES.)

FAVUS.

E. Graham Little, M.D., F.R.C.P.

Wolf¹ reports a case in an adult native American soldier, and comments on its rarity in the States. The disease had apparently persisted in the patient since early childhood. The smooth skin as well as the scalp showed disease. The scalp was cured by a single erythema dose of X Rays.

REFERENCE.—¹*N.Y. Med. Jour.* 1919, Aug. 30, 362.

FEET, EXCESSIVE SWEATING OF. (See SWEATING OF FEET, EXCESSIVE.)

FEVER IN CHILDREN. (See CHILDREN, FEVER IN.)

FIBROSITIS. Vaccines may be useful in treatment (*p.* 22).

FILARIASIS.

Sir Leonard Rogers, M.D., F.R.S.

ETIOLOGY.—K. M. Lynch¹ describes work on the periodicity of filarial embryos in the blood with the help of Smith and Rivas' method of estimating their numbers by mixing 1 c.c. of blood in 10 c.c. of 2 per cent acetic-acid solution to dissolve the red corpuscles, and microscoping a slide of the whole of the centrifuged sediment. He carried out experiments to test the truth of the theory that the daily periodicity of filarial embryos in the peripheral blood is due to varying tone of the minute vessels affecting the numbers passing through them, and found that the administration of nitroglycerin decreased, while epinephrin and pituitary extract increased, the numbers of both *Microfilaria bancrofti* and of *Microfilaria immitis* of dogs, during periods of both prevalence and paucity, which he holds supports the theory.

In opening a discussion on filariasis at the British Medical Association meeting, J. W. W. Stephens and W. Yorke² drew attention to the discrepancies

between the results of various workers in regard to the age-periods of the disease, and the microfilaria rate among those showing and those not showing lymphatic disease and elephantiasis and abscesses: indicating that more work is required. G. C. Low and P. Manson-Bahr,³ in the same discussion, summarized the evidence regarding the pathogenic properties of this parasitic filaria in the human subject, without bringing out any new points.

TREATMENT.—L. Rogers⁴ reports a preliminary investigation of the action of Sodium Antimonyl Tartrate intravenously in reducing the number of microfilaria in measured quantities of the blood of patients taken at the same hour each evening, but was unable to follow up the cases long enough to ascertain if the reduction was a permanent one. In a second communication⁵ he records further trials in eight cases in a jail, with counts extending over nearly six months, in half of which a prolonged great reduction in the embryos was obtained, while in the other half they increased again on stopping the injections. Some favourable clinical results are also recorded, but more work is required before this treatment can be established.

G. C. Low⁶ records a single case in which tartar emetic had only a temporary effect in reducing the filarial embryos in the blood. R. Knowles has also reported a similar failure to the writer, so it is clear that antimony does not exert such a definitely specific action against *Filaria bancrofti* as it does in bilharzial disease.

E. Schulmann, E. Jeanselme, and M. Pomaret⁷ report the trial of full doses of salvarsan in two cases of chyluria, with entirely negative results.

Filaria Medinensis or Guinea-worm.—J. W. S. Macfie⁸ reports a trial of Tartar Emetine intravenously in this disease with promising results, although he was not able to follow up his cases after they left hospital. Ten cases are recorded, which were collected with great difficulty at Accra in West Africa. In 5 the whole guinea-worm was in the body: in 2 of these the sore healed without the worm coming away; in 1 the worm broke off during extraction, but nevertheless the case did well; in 1 the worm was wound out; and 1 case was lost sight of. In the other 5 cases acute inflammation, following rupture of the worm in the tissues, was present on the patient's admission: in 3 of these the inflammation subsided and the wound healed without the worm coming away; in 1 the suppuration obscured the result; and 1 was early lost sight of. The treatment is thus clearly worthy of further trial.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, ii, 769; ²*Brit. Med. Jour.* 1920, ii, 231; ³*Ibid.* 233; ⁴*Lancet*, 1919, ii, 604; ⁵*Brit. Med. Jour.* 1920, i, 596; ⁶*Lancet*, 1920, ii, 551; ⁷*Pressc méd.* 1920, No. 30, 293; ⁸*Lancet*, 1920, i, 654.

FOOD DEFICIENCY DISEASES. (See DEFICIENCY DISEASES.)

FOOD POISONING. (See INFECTIOUS DISEASES PREVENTION.)

FRACTURE OF ATLAS. (See SPINAL SURGERY.)

FUNGI, THE HIGHER, IN HUMAN DISEASES.

Sir Leonard Rogers, M.D., F.R.S.

Castellani,¹ in his Milroy Lectures, deals with the many diseases associated with the higher fungi. In the first lecture he describes the classification of the fungi, and certain biological and biochemical characters by which he thinks they can be subdivided, especially the sugar fermentations; and he suggests that, by using fermentation tests with fungi having known actions, different sugars might be identified more easily than by chemical tests, and that this plan might be of use in urine analysis. He next discusses thrush, and gives the sugar reactions by which he has identified and named forty new varieties

of *Monilia*, although he admits that they may alter their reactions after cultivation for some time. He has found no less than eight of these varieties in sprue, which he thinks accounts for the frothy diarrhoea, although he does not agree with some authors in considering them the primary cause of the disease. He next describes eight genera of fungi causing bronchomycoses, including those due to *Monilia*, in which he places tea-taster's cough. Six genera involve the nervous system and organs of special sense, including the yeast fungi and the organisms of otomycosis, which are common in the tropics. Mycoses of the genito-urinary system are responsible for yellow, black, and red discharges from the urethra, and for various forms of vulvovaginitis. The last lecture deals with common fungal skin infections, including several varieties of trichomycoses and dermatomycoses, various tropical forms of ringworm or dhobie itch, tinea imbricata, and blastomycosis.

In dhobie itch he recommends Salicylic-Sulphur Ointment and Chrysophanic Acid, and for tinea imbricata Resorcin 1 part and Tinct. Benzoin. Co. 3 parts.

REFERENCE.—¹*Lancet*, 1920, i, 847, 893, and 943.

FURUNCULOSIS. (See also SKIN, GENERAL THERAPEUTICS OF.)

E. Graham Little, M.D., F.R.C.P.

Mauté¹ regards the use of Vaccines as much the best means of treating this condition, and he recommends the preparation of the vaccine without sterilization by heat, but by the addition of 0.5 per cent carbolic acid. He discusses the question whether stock or autogenous vaccines are the more valuable, and concludes that for prevention of relapses the autogenous is superior, but that the stock vaccine is better for the curative effect on an outbreak, and he considers the probability of this action being an example of benefit from the introduction of external proteins without specificity. When a rapid action is desired—e.g., at the height of a boil—intravenous injection of stock vaccines is to be practised; for instance, a dose of 10 million staphylococci may be given the first day, 15 million the second day, 20 million the third day, 20 million again on the fifth day; then, with an interval of three days, preventive inoculations with autogenous vaccine are used in the following manner—250 million the first day, 500 million three days later, 500 million four days after the second, 1000 million five days after the third, 1000 million five days after the fourth, 1000 million seven days after the fifth. General treatment should not be neglected, and the author recommends the administration of 6 to 8 drops of Hydrochloric Acid in the middle of each meal and a gramme of Charcoal at the end of it. He especially warns against giving arsenic. The best local treatment is to powder the skin surrounding the infection with a powder consisting of 100 parts Zinc Carbonate with 4 to 6 parts Cupric Sulphate.

REFERENCE.—¹*Presse méd.* 1920, Jan. 24, 64.

GALL-BLADDER AND BILE-PASSAGES, SURGERY OF.

E. Wyllys Andrews, A.M., M.D., F.A.C.S.

Erdmann,¹ in a series of cases from his own clinic, calls our attention to the unexpectedly high cancer-rate found in gall-tract disease. In 224 cases, definite primary carcinoma of the gall-bladder was found 15 times—6.7 per cent. These figures exclude 13 cases of generalized carcinoma of the upper abdomen, in which it was impossible to ascertain the primary focus, so the percentage given is probably too low. In all cases of cancer of the gall-bladder, stones were found, suggesting that irritation from this source may be a causative factor in the malignancy. He urges further study of this subject, and

suggests that as the operative mortality is only 2 to 4 per cent and the cancer-rate is 6.7 per cent or higher, it may prove to be justifiable to operate on all cases with a certain cholelithiasis, whether quiescent or not.

Barber² describes a new method of cholecystenterostomy as tried out successfully on dogs. The technique is very simple, and it can be done rapidly (*Fig. 27*). The method is clean and seems to assure against leakage, as the duct does not open for two or three days, when the intraduodenal portion is digested. In man, however, it may be that the larger duct will not digest so rapidly, and it may cause a severe biliary obstruction.

Goullioud³ discusses the localized hypertrophy of the liver about the gall-bladder called 'langnette hépatique' (*Fig. 28*). He finds that it occurs often enough to be of value in diagnosis of gall-stones. It is found only in severe cholelithiasis, and, while its presence is not constant, it occurs in a large proportion of cases. It is often palpable through the abdominal wall, and is frequently mistaken for an enlarged gall-bladder. Its discovery at operation is an almost certain indication of gall-stones, and, if none are evident, should cause the surgeon to search more carefully. It is found rarely

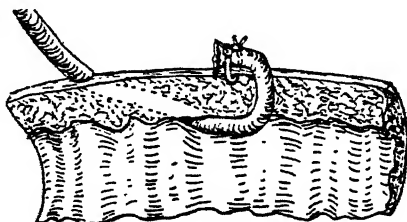


Fig. 27.—Relationship of bile-duct to intestinal wall and to lumen of bowel immediately after operation. Retraction probably always occurs, making leakage at exit impossible.

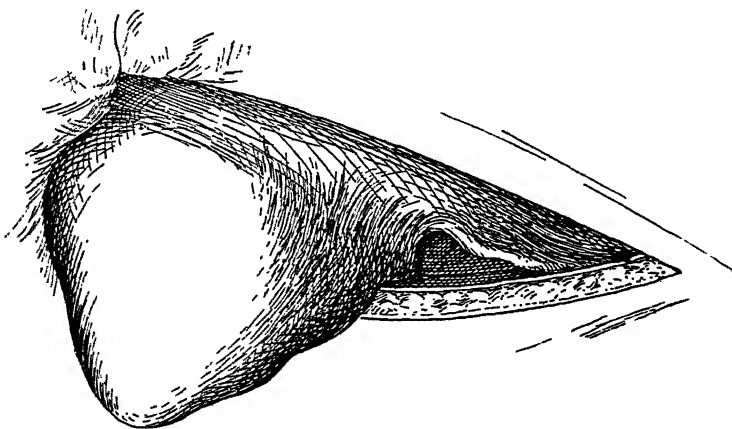


Fig. 28.—Localized hypertrophy of the liver—the 'langnette hépatique'.

in cancer and in severe cholangitis. The etiology is obscure. Stasis, infection, and possibly congenital factors are to be considered. The condition has a tendency to disappear after cholecystectomy.

Richter and Buchbinder,^{4,5} have advocated omission of drainage in many cases of gall-tract surgery. It has been their routine to close the abdomen in all cases except where there was severe infection present and those in which there was uncontrollable oozing from the raw surface of the liver. They had no fatalities, and in no cases has it been necessary to re-open the abdomen.

Several technical points are emphasized. The peritoneal flaps should not be sewn across the bed of the gall-bladder, but simply laid in, so as not to bridge across the fossa vesicularis and leave a dead space beneath. The cystic duct need not be ligated too close to the common. This predisposes to leakage of bile and is unnecessary. Most of the trouble reported from leaving it too long is due to failure to remove the lower end of the gall-bladder. Finally, the authors are most emphatic as to the treatment of the stump. This should not be buried, i.e., peritonealized. The peritoneum is much better able to take care of the mild infection than the retroperitoneal tissues in which it is customary to bury the stump of the cystic duct. In cases also where cholecystectomy is done, drainage has been omitted. Two contra-indications are given—a very small duct, and the presence of virulent infection. The former is very seldom met with, as when it is necessary to open the duct for stone, stricture, etc., it is usually dilated. Of course drainage cannot be omitted unless the duct is patulous at the end of the operation. The incision in the duct is closed with two rows of fine interrupted sutures, and the omentum dropped between the liver and the duodenum.

Halstead⁶ has used a fine tube in the stump of the cystic duct as the only drain, and agrees that the sutured incision in the common duct does not need drainage. On the third or fourth day the tube is clamped and the bile allowed to flow through the normal channels. As soon as it is evident that the common duct is open and not leaking, the tube is removed, and usually the drainage of bile is very slight.

REFERENCES.—¹*Amer. Jour. Obst.* 1919, Dec., 618; ²*Ann. of Surg.* 1919, Nov., 530; ³*Presse méd.* 1919, Dec. 3, 435; ⁴*Surg. Gynecol. and Obst.* 1919, Nov., 455; ⁵*Jour. Amer. Med. Assoc.* 1919, Dec. 6, 1750; ⁶*Ibid.* Dec. 20, 1896.

GALL-STONES, CLINICAL PATHOLOGY OF. O. C. Gruner, M.D.

Hansen¹ finds that the presence or absence of urobilinuria gives a clue to the diagnosis of gall-stones. His test is a quantitative one: 40 out of 50 cases of gall-stones show urobilinuria to an amount corresponding to a dilution of 1-20 or even higher. It is only when the stones are moving that this phenomenon occurs. If, in a case of jaundice, the urobilinuria reaction becomes negative even in a 1-2 dilution, and if the jaundice persists, there is strong evidence of complete obstruction of the common bile-duct.

See p. 28 for the value of X rays in diagnosis.

REFERENCE.—¹*Ugeskr. f. Læger*, 1920, 415.

GANGOSA. Use of Arsphenamin advocated (p. 4).

GASTRIC ANALYSIS. O. C. Gruner, M.D.

Technique: Apparatus.—MacIntyre¹ has suggested that the ordinary process of obtaining gastric contents is often difficult. He attaches the stomach-tube to a right-angled glass tube which enters through a rubber cork into a wide-mouthed jar, another right-angled tube, leading from the jar, being connected to the inlet side of a Higginson's syringe. In this way the contents can be aspirated easily and cheaply. Togani² describes an aspirating apparatus acting on a hydraulic principle. Ryle³ speaks favourably of the Rehfuess tube, which is here used for obtaining successive $\frac{1}{2}$ -hourly samples of the gastric contents (Figs. 29, 30). The tube is narrow (like a No. 6 catheter) and has a weighted end. The contents are withdrawn by means of a glass syringe a little larger than an ear syringe. This appliance can be warmly recommended.

The Test-meal.—Carnot's method has been advocated by Dupuy.⁴ The meal consists of broiled steak and bread-and-butter. It is thoroughly masticated, and each mouthful is expelled into a basin instead of being swallowed.

The mouth is rinsed out from time to time. The meal must last ten minutes. The tube is passed before, and ten minutes after, the conclusion of the 'sham meal'. No saliva must be swallowed until after the second sample has been obtained. In this way 30 to 90 c.c. of clear gastric juice are obtained; it is

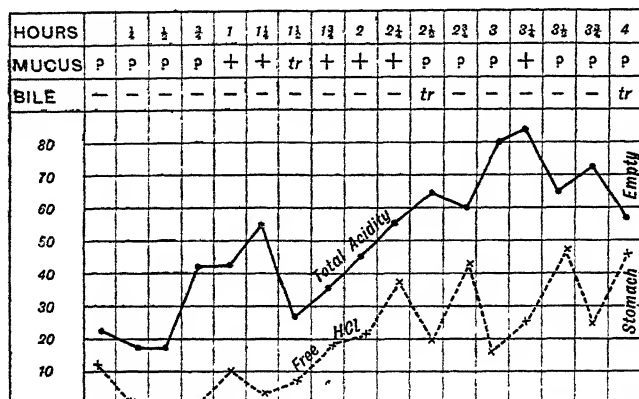


Fig. 29.—Normal fractional test meal (mill).

very easily analyzed. Miller⁵ and associates have made a careful inquiry into gastric secretion by this method. Tea, coffee, and cocoa as test-meals were employed by these observers⁶ in order to study the action of these substances, and are not advocated for routine meals. In Miller's work⁶ the functional power of the stomach is also studied by noting the amount of urine excreted during ninety minutes after the test-meal.

Dealing with the question of studying the stomach in a fasting condition instead of using a test-meal, Jarno⁷ discusses the observation that borborygmi occur alternately with periods of outflow of gastric juice; he noted the duration of time between the last meal and the perception of borborygmi by the patient. It was found that borborygmi cannot occur if there is acid gastric juice in the stomach; therefore absence of this symptom denotes abnormality. Pron's advocacy of a study of the fasting stomach rather than of a test-meal has important bearings on the subject of gastric analysis.

Significance of Gastric Analysis.—Pron⁸ shows that ordinary physical examination is of supreme importance in deciding whether digestion is abnormal or not. The succussion-sound is tested for after a night's fast. If succussion

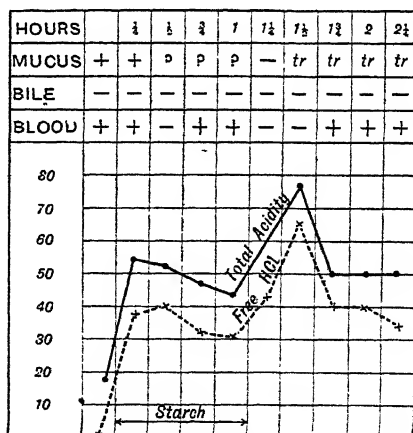


Fig. 30.—Fractional test meal in a case of duodenal ulcer.

can be obtained under such conditions, the very first problem is settled; that is, the stomach of such a patient is disordered. There are four devices for obtaining succussion (in the half-sitting posture, percussion to left of epigastrium; posture half-turned to right, percussion at end of inspiration). The use of a stomach-tube is misleading, because excess of mucous secretion will not enter the tube. Even if gastric contents are removed, the results are misleading, because this matutinal fluid may contain bile, mucus, salt solution, other acids than HCl, or mixtures of these bodies, and the amount of deposit varies independently of definite forms of gastric disease; a subsequent test-meal, admixed as it becomes with these various forms of residue, will yield no reliable results. But if the matutinal contents contain bile, the digestive error is hepatic in origin; if HCl is present, a solution of acetic acid may be run in, in the expectation of forming hæmin crystals with the blood which is always present on the floor of an unhealed gastric ulcer.

Chemical Analysis.—Shohl⁹ gives a lengthy study of the methods of determination of the acidity of gastric contents. The electrometric method is discussed elaborately, on the ground that no assessment of acidity is correct unless it be in terms of hydrogen-ion concentration. A colorimetric method may be used in virtue of a good scale of indicators being now available. It is pointed out that indicators give false values when proteins or salts are present, because in that case some acid is taken up, and dissociation is incomplete. The effective acid is that which is demonstrated in virtue of hydrogen-ion concentration. The colorimetric method is also unsatisfactory where iron and salicylates have been administered. A third method of study is given, where the 'buffer value' of the stomach contents is determined. This term expresses the fact that proteins and salts hold acid or alkali (which is used for titrating the sample) and prevent the real acidity from becoming manifest. They act as buffers between the reagent used and the free HCl present. *Technique:* If free HCl is present, add 1 drop of 0.2 per cent thymol-sulphonphthalein in alcohol for each cubic centimetre of stomach contents. Titrate with decinormal soda till the indicator is quite blue. The value of the free HCl obtained by using indicators is subtracted from the titration value. If no free HCl occurs, instead of using decinormal soda, 0.05 normal HCl is added till orange appears; then a second sample is titrated with decinormal soda as before till the blue colour is reached. The sum of the value obtained by adding HCl solution and the value given by titration constitutes the buffer value.

In view of Pron's suggestions, the study here referred to has really only an academic interest. It may be noted that the determination of hydrogen-ion concentrations is becoming the vogue, under the idea that exact measurements of body-fluids are *ipso facto* free from fallacy.

Rehfuß and Hawk, in two papers,^{10, 11} bring forward considerations and 'basic facts' which should make it clear that ultra-chemical and physico-chemical refinements are no safeguard against entirely fallacious conclusions. Many elaborate clinical methods seem to represent great advances, but all are found to be entire waste of energy in the light of such basic facts as apply to the subject of gastric analysis. These workers show that: (1) Every individual has his own characteristic form of gastric digestion, just as the *x* rays show everyone to have his own type of gastric form; (2) The normal standard contains a number of types; (3) There is no series of features which can be called pathognomonic for any particular pathological condition; (4) There is a different gastric formula for every type of diet. They also point out that a person may have 'hyperacidity', and show nothing of the kind when the gastric contents are titrated. That is, an aberration of function does not run

parallel with laboratory conceptions about the meaning of 'acidity'. It will be noted that these authors are accustomed to study the gastric contents at $\frac{1}{2}$ -hourly intervals, and that they have arrived at their conclusions after very extended tests carried over many years. The details may be well studied in either of the two references given.

After this type of work, the suggestion of Baufle,¹² which enables a more correct calculation of acidity of test-meals, may seem superfluous. It is, however, of interest. He gives ferric sulphate with the test-meal, and estimates the iron in the subsequent specimen. The volume of the meal and of the specimen must be known, and the iron enables an estimate to be formed of how much of the specimen was food residue and how much was gastric secretion.

McClure and Reynolds,¹³ discussing the differential diagnosis of gastric and duodenal ulcers, conclude that laboratory findings are less useful than radiographic studies. The only really useful findings are the gross amount of blood in the vomitus or test-meal, the frequent vomiting of old food residues, and tarry stools. Findings of less value are the persistent presence of occult blood in the stools, the presence of food residue, and of free HCl, in the gastric contents.

An edestin method for the estimation of pepsin in stomach contents is given by Farrington and Lewis.¹⁴ It introduces certain simplifications of the ordinary edestin technique, but remains essentially a laboratory method.

REFERENCES.—¹*Glasgow Med. Jour.* 1920, Aug., 101; ²*Jour. of Lab. and Clin. Med.* 1919, Dec., 178; ³*Lancet*, 1920, ii, 490; ⁴*Paris méd.* 1920, April 3, 286; ⁵*Amer. Jour. Physiol.* 1920, May 1, 1; ⁶*Ibid.* 28; ⁷*Wien. klin. Woch.* 1920, July 1, 578; ⁸*Presse méd.* 1920, June 12, 381; ⁹*Johns Hop. Hosp. Bull.* 1920, May, 152-66; ¹⁰*Jour. Amer. Med. Assoc.* 1920, Aug. 14, 449; ¹¹*Amer. Jour. Med. Sci.* 1920, Sept., 428; ¹²*Paris méd.* 1919, Nov. 29, 428; ¹³*Boston Med. and Surg. Jour.* 1920, Sept. 9, 321; ¹⁴*Jour. of Lab. and Clin. Med.* 1919, July, 635.

GASTRIC AND DUODENAL ULCER. (See also STOMACH, SURGERY OF.)

Robert Hutchison, M.D., F.R.C.P.

There has recently been a movement of opinion in favour of the medical rather than surgical treatment of uncomplicated gastric and duodenal ulcer. The plans of treatment adopted by different advocates of medical methods vary in detail, but in all the object aimed at is to allow healing of the ulcer by Rest along with a Diet which 'fixes' as much acid in the stomach as possible, whilst Antacids are administered at the same time to neutralize the hydrochloric acid of the gastric juice, the underlying idea being that it is very largely free acid which interferes with the healing of the ulcer. This idea, however, has been challenged by some observers, such, for example, as Crohn and Reiss,¹ who have shown, by tests carried out on patients who were actually undergoing medical treatment for ulcer, that in only a minority is hyperacidity really affected by the treatment. Smithies² also is sceptical as to the so-called 'corrosive action' of the gastric juice. None the less, even those who do not support the theory on which medical treatment is based still agree that it is capable of leading to healing of ulcers unless they are very chronic and indurated.

The most thorough of the medical plans of treatment is that of Sippy, of Chicago. It is thus described by Weiss,³ who has had considerable experience of it:—Patients are put to bed for from three to four weeks. It has been my practice in some cases to withdraw all food by mouth for the first four or five days. The patient is given a daily cleansing soapsuds Enema every morning at 7 o'clock. Thirty minutes later he has a Suppository consisting of $\frac{1}{2}$ to 1 gr. extract of belladonna. At 8 o'clock he is given a Nutritive Enema,

and this is repeated at 12 noon and at 4 and 8 p.m. If the patient is unusually restless or nervous, 10 to 20 gr. of Sodium Bromide may be included in one of the enemas. The enemas are given slowly through a small soft-rubber catheter, inserted not more than two to four inches within the sphincter. In addition a Priessnitz binder is usually applied in the morning and left on the entire day, and, if not uncomfortable to the patient, during the night as well. While many patients might do just as well without the preliminary starvation period, in my experience it does them no harm, and, so far as can be judged, is of considerable benefit in allaying pain, vomiting, and nausea, and improving the general well-being of the patient. While this preliminary starvation period might well be cast aside in most cases, in patients with a bleeding ulcer I feel that it is absolutely necessary. The only difference in the treatment just outlined is that an ice-bag or ice-coil is applied to the abdomen instead of the Priessnitz binder, and sufficient morphine and atropine is given hypodermatically to ensure complete rest of the gastro-intestinal tract.

After the above starvation period, mouth-feeding is begun. Each morning one half-hour before the first feeding, a drachm of Bismuth Subcarbonate is given in a little water. Feedings are given every hour from 7 a.m. to 7 p.m., consisting of equal parts of milk and cream in amounts of a total of 1 to 3 oz. Although acidity is more easily controlled by hourly feedings, some cases do well on two-, three-, or four-hourly feedings. Half-way between each feeding a powder consisting of 10 gr. each of Calcined Magnesia and Sodium Bicarbonate is given, alternating with another powder of 10 gr. of bismuth and 20 to 30 gr. of sodium bicarbonate. It is best to give the powder containing magnesia as often as possible, as the magnesia has four times the power of neutralizing the free hydrochloric acid as compared with the soda; diarrhoea, however, is apt to follow its free use, so that one must alternate these powders according to this condition. After two or three days, soft eggs and well-cooked (fine) cereal are added, so that at the end of about ten days the patients are receiving 3 oz. of milk and cream mixture every hour from 7 a.m. to 7 p.m., 3 soft-boiled eggs, one at a time, and 9 oz. cereal, 3 oz. given at each of the three feedings. These extras are added one at a time until the six extra feedings of eggs and cereals are given evenly spaced throughout the day. The bulk of each feeding should not exceed a total of 6 oz. In order that the treatment should be successful, an accurate control of the acidity must be maintained throughout the twenty-four hours. This is accomplished by testing the gastric contents from time to time, early in the treatment, by the stomach tube. Sippy's method for accurate control of the free hydrochloric acidity is somewhat as follows: The first day or two the tube is passed occasionally to check the presence of free HCl: if this is present in the stomach contents, the alkali powders must be increased, as the treatment aims absolutely to keep the free HCl down to zero. After a day or two this is done as a routine two or three times a week, as practically that is all that is necessary to ensure the absence of the hydrochloric acid.

The amount of alkali can be varied as determined by the examination of the stomach contents. It is particularly necessary to be sure that the stomach does not contain free acid during the night, and it may be necessary to give two or three alkali powders between 7 and 10 p.m. to insure this. At 10 o'clock the tube should be passed and all acid hypersecretion removed. If there is a considerable amount of this, the tube should be passed again during the night two or three times. After the first few days' treatment this is rarely necessary, as the hypersecretion is usually well controlled, and at 10 p.m. nothing but a very few cubic centimetres of gastric contents will be found, and this is unimportant.

In the diet, cream soup, vegetable purées, or other soft foods, such as jellies, custards, creams, may be added or substituted, keeping, however, the milk, cream, eggs, and cereal as the basis of the diet. The best cereals are farina, cream of wheat, and rice cooked to a soft pulp. With this diet it is quite regularly that the patients show a gain from 1 to 4 lb. a week.

During the third week, soft toast or crackers, purée of potato, and cream soup may be added. In the fourth week the milk and cream may be made $2\frac{1}{2}$ oz. each at each feeding, and the period between feedings may be lengthened to two hours. After two or three weeks more, three-hour feedings may be given, but if the ulcer is of some months' duration it is best not to increase the periods too rapidly, and for several months it is wise not to have the patients take less than five feedings a day. The morning bismuth should be taken for from six to eight weeks and then stopped, but the alkaline powders should be continued between feedings for several months.

During a period of a year or more, milk, cream, eggs, vegetables, purées, cereal, bread and butter, and meat should form the basis of the diet. In cases in which for one reason or another milk is distasteful, it often can be given if flavoured with tea, cocoa, grape-juice, etc.; frozen balls of butter may be substituted for cream, and a small quantity of cereal gruel may be given each hour.

Hurst¹ speaks enthusiastically of the method, which he has modified as follows:—Five ounces of milk (preferably milk and cream in equal quantities) are given every hour from 8 a.m. to 8 p.m. inclusive. To each feed 10 gr. of **Sodium Citrate**, which combines with the lime in the milk, and consequently prevents the formation of irritating clots by the rennin of the gastric juice, dissolved in 2 drachms of **Emulsio Magnesiae**, are added; the latter contains 5 gr. of oxide of magnesia to the drachm. This has the advantage over sodium bicarbonate in having four times its neutralizing power, in giving off no carbon dioxide—which is liable to distend the stomach on reacting with the hydrochloric acid—in having a mild aperient action, and in producing a very much smaller secondary increase in secretion after the initial neutralization than sodium bicarbonate, which Crohn has shown, by the fractional test-meal, to be the most powerful stimulant of gastric juice in existence.

Immediately before alternate feeds, beginning at 7.30 a.m., half an ounce of **Olive Oil** is taken. This inhibits the secretion of gastric juice; at the same time it supplies a digestible and absolutely unirritating food of very high nutritive value in a concentrated form. Immediately before the remaining feeds, 5 min. of **Tinct. Belladonnæ**, which has a similar inhibiting effect, is given, as oil before each feed sometimes gives rise to nausea and is more than can generally be digested.

Half an hour after every feed, and at 9, 9.30, and 10 p.m., a powder containing 10 gr. **Calcium Carbonate** and 30 gr. **Bismuth Carbonate** is taken in a little water. The former has two and a half times, the latter only one-third, the neutralizing power of sodium bicarbonate, but neither gives rise to any secondary hypersecretion, and they neutralize the acid so slowly that the carbon dioxide set free is dissolved in the gastric contents as rapidly as it forms. At 6 a.m. $\frac{1}{2}$ oz. bismuth carbonate, shaken up but not suspended in 5 to 10 oz. of water, is swallowed, and the patient then lies on his right side, or in such a position that the powder is likely to come in contact with the ulcer. This forms a protective covering to the ulcer, and at the same time neutralizes any acid present, and calls forth a local secretion of protective mucus.

By these means the contents of the stomach are kept neutral or alkaline from 6 a.m. to 10 p.m. If the ulcer is in the neighbourhood of the pylorus, and especially if it is giving rise to any obstruction, continuous hypersecretion

of gastric juice will occur throughout the night. It is then impossible for the ulcer to heal, and in the past it has been supposed that such cases must be operated upon. But the obstruction is generally due entirely, or in great part, to surrounding œdema and inflammatory swelling and pylorospasm, and in such cases, if the ulcer can be caused to heal by medical or surgical treatment, any scarring produced is insufficient to give rise to obstruction.

Sippey has shown that by preventing the accumulation of acid in the stomach during the night these ulcers heal, and a cure can be obtained in most cases without resorting to surgery. At 11 p.m. the stomach is completely emptied by Senoran's evacuator; if not more than two ounces of fluid are present on two consecutive nights, this can be discontinued. If half a pint or more is removed at 11 p.m., the stomach should be evacuated again at 1 a.m. At 11 p.m. Atropine Sulphate is injected subcutaneously in order to inhibit the further secretion of gastric juice; the largest dose which does not produce unpleasant dryness of the mouth should be given, beginning with $\frac{1}{30}$ gr. At the same time the alkaline powder should be taken, and if more than two ounces of fluid were evacuated it should be repeated every two hours through the night. In most cases the continued nocturnal secretion is rapidly controlled by this treatment.

If the patient is constipated, the dose of magnesia should be increased, and if the bowels are not opened on two consecutive days an enema should be given. If diarrhœa occurs, some magnesia should be replaced by an equivalent amount of bismuth carbonate.

The strict treatment just described should be continued until for three weeks the patient has had no spontaneous pain, no trace of tenderness has been present, no occult blood has been found in the stools, not more than two ounces of fluid have been removed on any one evening, and the *x* rays show no evidence of *active* ulceration. The pain and tenderness generally disappear within forty-eight hours; the other signs of healing appear considerably later, the exact time depending upon the size and age of the ulcer and its proximity to the pylorus.

Ohnell⁵ also, in Scandinavia, claims to have brought about healing by medical treatment only, even in ulcers which showed a definite niche with the barium meal. His plan may be summarized thus: The patient is kept absolutely still on his back for four weeks, and in bed for a further two weeks. If the patient wearies of lying on his back and finds it difficult to sleep in this position, Ohnell gives a little sedative by the rectum the first few nights. This aids further in reducing peristalsis during the first three or five days in which nothing is allowed by the mouth, and the extremely cautious resumption of food thereafter. Moist heat is applied with fomentations for about a month; then he changes to cotton, and when the patient gets up this is changed for an abdominal band. Fluids are supplied copiously by the rectum: 10 per cent grape-sugar solution, 6 per cent honey, or 0.9 per cent sodium chloride. He began with 400 grms. three times a day, reducing the amount proportionally as feeding by the mouth is resumed, never letting the fluid intake drop below 1 litre a day. To ward off thrombosis, the patients are made to change the position of their legs repeatedly. Hygiene of the mouth is enforced. He had no parotitis develop in any instance. The bowel movements are promoted by an enema on alternate days. The patient is warned not to strain. It is better to let feces accumulate than to strain and hinder healing at first. The diet is 30 grms. of milk seven times a day, repeated the seventh day plus the yolk of an egg. But 400 grms. of 10 per cent sugar solution are given by the rectum three times a day from the first day on. Then two rectal injections are made, and the seven milk

feedings total 630 grms., with two yolks. The rectal injections are dropped on the fourteenth day, and 180 grms. of milk are fed seven times, plus four yolks. On the fourteenth day, 210 grms. of milk seven times a day and five yolks, and after this two to five soft-boiled eggs, zwieback, and butter are given, with up to 1500 grms. of milk, in five feedings. The course takes a full month.

It will be noticed that all these methods are very troublesome both to the patient and the nurse, but it need not be doubted that many ulcers will heal under them, and indeed the same result can be brought about by a less exacting procedure. The question remains, however, how long will the ulcer remain healed. To this question it is hardly possible as yet to give a satisfactory reply, as the methods have not been in use long enough—in their above elaborate form—to enable one to judge of their final results. The mere elaborateness of the plan used to bring about healing is, of course, no guarantee of the permanence of its effects, and in spite of all care in prophylaxis it is to be expected that relapse will occur in a considerable number. On the other hand, the permanent reduction of gastric acidity which Gastro-enterostomy almost invariably achieves is, on the theory of the advocates of medical treatment themselves, the best guarantee of a lasting cure.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1920, Jan., 70; ²*Jour. Amer. Med. Assoc.* 1920, June 5, 1555; ³*Med. Record*, 1919, Nov. 29, 867; ⁴*Brit. Med. Jour.* 1920, i, 559; ⁵*Abst. in Jour. Amer. Med. Assoc.* 1919, Nov. 29, 1726.

GASTRIC SURGERY. (*See* STOMACH, SURGERY OF.)

GASTRIC TUMOURS. (*See* STOMACH, SURGERY OF.)

GASTRO-INTESTINAL DISORDERS IN CHILDREN. (*See* CHILDREN, GASTRO-INTESTINAL DISORDERS IN.)

GENERAL PARALYSIS. (*See* MENTAL TROUBLES OF SYPHILIS; NERVOUS SYSTEM, CENTRAL.)

GENICULATE GANGLION SYNDROME, THE (Herpes Zoster Oticus, with Facial Palsy and Acoustic Symptoms).

J. Ramsay Hunt, M.D.

M. A. Souques¹ describes in detail a case of herpes zoster oticus with facial palsy and acoustic symptoms, a syndrome described some years ago by Ramsay Hunt. The affection begins acutely, with elevation of temperature, slight rigors, and severe lancinating pains which are localized in the depths of the auditory canal and region of the mastoid (herpetic otalgia). These pains may reach an extreme degree of intensity and simulate the pain of acute otitis and mastoiditis. In a few days the external ear becomes red and swollen, and herpetic vesicles—singly or in groups—make their appearance in the interior of the auricle (concha, antihelix, antitragus), the external auditory canal, including the tympanum, or in the cleft posteriorly between the mastoid process and the lobule of the ear. In some cases herpetic vesicles also appear within the buccal cavity, on the anterior two-thirds of the tongue, and the soft palate. This is Hunt's 'zoster zone of the geniculate ganglion', and is subject to considerable variation owing to the vestigial nature of this cutaneous distribution, and the extensive overlap from neighbouring nerves (5th, 9th, 10th, and cervical branches).

Following the eruption, a peripheral facial palsy usually develops, and not infrequently auditory symptoms, which may vary in severity from hypoacusis and tinnitus aurium, to the severe form of Ménière's syndrome

(nausea, vomiting, vertigo, disturbances of equilibrium, and nystagmus). These paralytic manifestations occur usually toward the end of the first week. This triad (herpes oticus, facial palsy, and acoustic symptoms) is referable to an herpetic inflammation of the geniculate ganglion, which lies on the facial nerve in the depth of the internal auditory canal. Herpes oticus may exist alone, the trunk of the facial nerve escaping the inflammatory process (herpetic inflammation of the geniculate ganglion). In many cases, however, the inflammatory process, by pressure upon or invasion of the nerve trunk, paralyzes the 7th nerve and a Bell's palsy results, as all of these structures are closely associated in the depth of the internal auditory canal.

The acoustic symptoms have a similar origin. In some cases it is believed that they are produced by simultaneous herpetic inflammation of the peripheral ganglia of the auditory nerve (the ganglia of Scarpa and Corti).

Souques emphasizes the importance of this group of cases, and the probability that many painful forms of facial palsy are of this nature, the herpetic eruption, which is very small and concealed in the folds of the auricle, escaping detection. In some cases there is a very persistent and intractable form of post-herpetic otalgia (geniculate neuralgia).

Herpes zoster or zona is an acute infection with localization and inflammatory reaction in the posterior spinal ganglia. The posterior ganglia of the various cranial nerves (Gasserian, jugular, etc.) are also liable to this form of inflammatory disease, and among them the geniculate ganglion of the facial nerve. The frequency of the paralytic complications (7th and 8th nerves) is due to the close anatomical relationship of the *ganglion geniculatum* to these structures, within the confines of a bony canal. The facial nerve, like the trigeminus, is a mixed nerve. The motor division is the facial nerve proper. The sensory portion consists of the nerve of Wrisberg (posterior root), the geniculate ganglion, and peripheral divisions—viz., the great and small petrosal nerves, and cutaneous branches which emerge with the trunk of the facial and are distributed to the zoster zone of the geniculate.

[In addition to the geniculate syndrome, this system may also be the seat of localized neuralgic affections, primary and secondary, the so-called *geniculate neuralgia* (Hunt's neuralgia), which occasionally require differentiation from certain types of trigeminal neuralgias (see NEURALGIA).—J. R. H.]

REFERENCE.—¹*Bull. Soc. méd. Hôp.* 1920, xxxvi, 146.

GLAUCOMA.

J. Burdon-Cooper, M.D., D.O.

Lister¹ calls attention to the importance of raising the flap in Elliot's trephine operation in one layer, using the scissor points, and prefers a 1½-mm. trephine rather than the 2-mm. recommended by Elliot; he does the iridectomy after removing the trephine disc, and waits a time before replacing the flap, to avoid leaking of blood into the anterior chamber. He deprecates massaging the blood out, and prefers irrigation of the anterior chamber. Lloyd² calls attention to the necessity of taking the tension instrumentally before cataract extraction, mentioning the fact that glaucoma may be one cause of delayed union following senile extraction. Stirling,³ in notes on the blockage of the trephine opening after Elliot's operation, states that the accident is not common; in 46 operations it occurred in 4, three of which were congestive glaucoma of long standing, and early blockage occurred, the hyperplastic tissue being uveal in origin. This being so, he leans to the view that the condition is an autotoxæmic one lighted up by operative traumatism. Elliot believes these cases are septic, the septic element being present before operation, and not introduced by it. Ewing⁴ trephined two cases 7 to 9 mm. behind the sclerocorneal margin, between the exterior and superior recti

(Argyll Robertson operation); the tension of the eyes still remained above normal, but pain was relieved, and the more advanced eye became quiet. Clapp⁵ denounces wholesale Elliot's operation, and comes to the conclusion that the trephine operation has late results which may develop years afterwards, and that it should not be an operation of choice, but should be tried where iridectomy has failed, and in buphthalmos. He considers there is neither permanent lowering of tension nor restoration of vision, and there is a risk of late infection. Simple glaucoma may become fulminating, and vision may be reduced.

Morax⁶ draws attention to the orbitofacial pains and watering of the eye, in addition to the ordinary signs of glaucoma. He advises the use of the tonometer in inexplicable orbitocephalic and facial pains; a miotic relieves such cases due to tension. He notes that in the days of Demours glaucoma was regarded as a disease of the orbital periosteum and frontal-sinus mucous membrane.

Lamb⁷ suggests that acute congestive glaucoma is due to an imperative demand upon the adrenals which cannot be met, with the result that the sympathetic tone is lowered, and the balance is thrown under the control of the vagus, with resultant venous congestion and turgescence. The indications suggest the use of **Pilocarpine** and **Adrenalin**.

Colombo⁸ holds that a filtration cicatrix does not occur in the absence of uveal tissue, and that it is formed by more or less involvement of this tissue. This involvement being concerned also with iridocyclitis, which so commonly follows the operation for its production. His opinion is that the ideal operation must cause some involvement of uveal tissue, which need not, however, be visible to clinical examination.

Hunter McGuire⁹ found iridectomy and trephining of no avail in traumatic hydrophthalmos in a child four years of age. Gifford¹⁰ is disappointed with trephining as a mode of treating buphthalmos. Morax¹¹ decides that atrophy of the optic nerves with excavation should not be classed as simple glaucoma; it is slowly progressive and not influenced by operation or miotics. Bohn¹² describes the microscopical anatomy of four cases of buphthalmos in which iridectomy was done: in all there was no Schlemm's canal. Descemet's membrane was ruptured, the lens was cataractous, the retina and choroid were atrophic, and the discs were cupped. Operation (iridectomy) failed.

Prince¹³ describes his method of aqueoplasty, using a gold ring with a solid piece on it, the latter resting vertically in the trephine hole, while the ring portion is covered by the flap.

Knapp¹⁴ writes on the medical side of glaucoma, and appears to accept the view, now generally adopted, that, in the relation general-system pressure-rise of eye tension, it is difficult to trace cause and effect. He is struck from his own cases with the frequent and marked changes in the arteries (thickening and white lines) and disc pallor in acute glaucoma, after the attack has passed off. The investigations into nephritis, nasal empyema, and nervous disturbances as causes of glaucoma have not yielded the results which were expected, but the evidence forthcoming suggests an involvement of the sympathetic nervous system. Hughes attributes a case of glaucoma seen by him to 1 per cent solution of holocaine used for refraction purposes.

Parker¹⁵ contributes an excellent paper on the status of sclerocorneal trephining for the relief of glaucoma, and recommends the selection of the operative procedure (iridectomy or trephine) which is best suited to the particular case, in preference to subjecting all eyes to the same operation. He is surprised to find the results of iridectomy so good.

Weeks, in an interesting paper at the Ophthalmological Section of the

American Medical Association last year, gives his observations on the treatment of glaucoma. The causes of hypertension, as he regards them, are (1) Obstruction to the outflow of fluids from the interior of the eye; (2) Sclerosis affecting the lymph spaces at the sclerocorneal junction; (3) Increase of the intra-ocular secretion from abnormal conditions of the vascular system; and (4) Retention of aqueous in the posterior chamber. He says that at least 90 per cent of adult patients with idiopathic glaucomas suffer from constipation, and the correction of this goes far to relieve the glaucoma. The normal range of tension, using Schiötz's tonometer, varies between 16 and 25 mm. Hg, and an interesting point he brings out is the great variation in the tension at different times. He uses *Pilocarpine* and *Eserine* as miotics, and has found no difficulty in combining *Dionin* with them. He employs miotics prophylactically as well as curatively, emphasizing the importance of tonometric measurements of tension. He resorts to miotics when the tension is above 25, endeavouring to keep it at or lower than that figure. He mentions a case in which, after two years of hypertension and use of miotics, the tension became normal again, and after three years no hypertension had developed. He keeps a sharp eye on the fields for form and colour, and the degree of visual acuity. In hypertension following operation, say, for cataract, if *eserine*, $\frac{1}{2}$ per cent, used three times in twenty-four hours, does not keep the tension at or below 25, he insists, with few exceptions, on operation.

In secondary glaucoma, miotics (if the tension is above Schiötz 35) are of little value as a rule. He always tries the effect of miotics before operation. As indications for operation he gives the following: (1) Where there is diminution of the field for form and colours, with or without enlargement of the blind spot—an urgent indication; (2) Where miotics cannot be used regularly; (3) Where the patient may be for long periods away from efficient observation by a competent oculist. He favours early operation, and where the eye is not congested at the time, visual acuity and fields are little altered. A small field of vision up to the fixation point need not deter operation, nor do retinal hæmorrhages contra-indicate operation if other conditions are urgent.

As to the type of operation, this must be determined by the case. *Buphthalmos* and infantile glaucoma are not as a rule satisfactorily treated with miotics, though in some cases they do well. He speaks well of paracentesis at the limbus, making the opening patent every five to eight days for a few times as required, especially if followed by miotics. From 4 to 8 years of age, trephining is the operation of choice. Neither iridectomy nor Lagrange's operation is satisfactory, on account of the extreme thinness of the sclera and cornea. As the trephine opening has a tendency to enlarge by stretching, a small trephine should be used.

He states that secondary glaucoma is encountered in about 4 per cent of cataract cases, the causes of this being entanglement of the iris in the angle of the wound and sometimes the capsule of the lens. He divides the incarcerated pillars of the coloboma, trephines, or does iridectomy. For secondary glaucoma accompanying acute iritis, if it does not subside in a few days, he prefers paracentesis, opening the wound every two or three days, doing it at the limbus, and pushing up a narrow conjunctival flap before the knife without dividing it. For secondary glaucoma following, say, interstitial keratitis, and due to partial closure of the lymph spaces at the sclerocorneal junction, a filtration cicatrix must be made. For acute idiopathic glaucoma he usually employs 1 per cent *Eserine* every hour, a *Calomel* purge, a hypodermic of *Morphia*, and *Light Diet*. If after twelve hours the tension is not diminished, he operates; if the tension has subsided, he postpones operation till the eye is quiet, and does a broad iridectomy—a posterior sclerotomy before the

iridectomy is seldom necessary. In subacute and chronic cases he prefers a filtering cicatrix. He reserves the Elliot operation for buphthalmic cases, some cases with deep anterior chamber, and cases of chronic simple glaucoma with relatively low tension. The other operation he prefers is that of Lagrange. He rightly insists on the after-treatment with this operation, and massages the eyeball forty-eight hours after operation in all cases where the tension is not subnormal, the idea being to bulge the conjunctival flap. The massage should be kept up in order to produce a filtration cicatrix, the patient being instructed how to perform it. He seems to prefer Elliot's operation for hospital work, where satisfactory after-treatment is not forthcoming, and Lagrange for private practice.

At the subsequent discussion, Pusey recommended operation: (1) In all cases of acute, subacute, and chronic glaucoma with inflammatory symptoms when miotic treatment cannot be kept up, when the patient resides at a distance; (2) On one eye (the most affected one) in a patient under 55, using miotics for both eyes, and on the other if the vision is maintained or improved by the operation on the first; (3) In all cases where the field, irrespective of two months' unremitting miosis, shows progressive deterioration. He prefers iridectomy, but agrees with Weeks that trephining is the operation of election in buphthalmos.

To Vale we are indebted for the suggestion of incorporating one grain of **Camphor** with the **Eserine** when this has to be used continuously, in order to prevent the pseudotrachomatous conjunctivitis which follows the continuous use of the drug.

Crooks has suggested that glaucoma following cataract extraction may be due to transplantation of epithelial cells into the anterior chamber, which they line, giving rise to an inveterate glaucoma. He thinks the keratome is a great offender in this respect. For cases not controlled by miotics, Webster Fox prefers Elliot's operation; but where the field fails rapidly, with much cupping of the disc, he thinks the Lagrange is preferable. He prefers a keratome, using only the Graefe for sclerotomy and the Lagrange operation.

Parker thinks we ought to select the cases for iridectomy, leaving the rest for trephining and the Lagrange operation. He divides the selected cases into anterior and posterior simple glaucomata. If the obstruction is at the angle of the anterior chamber, which is deep in consequence, iridectomy is the operation of choice. Where the obstruction is in the posterior spaces, and the anterior chamber is shallow, no result could be hoped for from opening up the angle. Iridectomy could not be expected to give relief. [We entirely agree with Parker's experience.—J. B.-C.]

We cannot do more than briefly allude to one or two points in connection with Elliot's¹⁶ lecture on the diagnosis of glaucoma. These papers should be read in the original. He offers an ingenious explanation of a morning headache, namely, that it may be due to tension in the eye, owing to the cessation with sleep of the pump-like action of the iris and ciliary body, this determining the onset of a condition in which excretion is insufficient for the needs of the eye. He views with suspicion headaches of elderly people persisting in spite of careful correction of the refraction and muscle balance. He rightly insists on the importance of severe headache with vomiting as an indication of acute glaucoma. [We remember being called at midnight to see an old lady of 87, who only half an hour before had become severely ill with headache and vomiting. There was no other symptom of acute glaucoma than that of stony hardness of the eye, the media were perfectly clear, and there had been no time for cupping of the disc to occur. Rarely does an ophthalmic surgeon see a case so early, and we were struck by the severity of the symptoms, with so

little apparently to account for the illness. There was no pain in the eye, but excessive headache in the right occipital region (the right eye being affected) was complained of. The eye was iridectomized fourteen hours after the onset, and ultimately obtained normal visual acuity.—J. B.-C.]

The practitioner may find difficulty in diagnosing between glaucoma and iritis. The diagnosis is not difficult to the experienced. In iritis, small pupil,

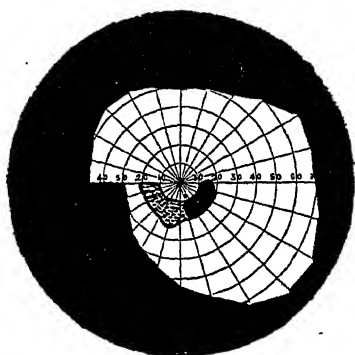


Fig. 31.—Visual field (R.E.) showing Boenne's step and Bjerrum's sign.

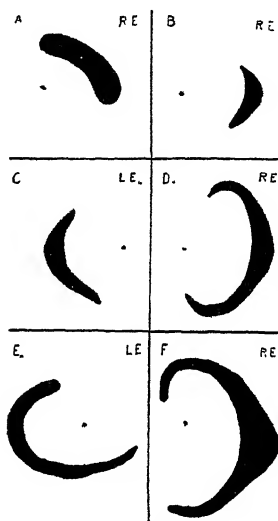


Fig. 32.—Scidel's sign.

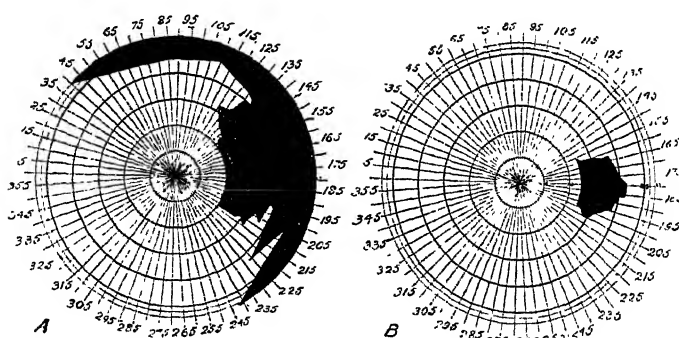


Fig. 33.—Elliot's sign of glaucoma. A, Before operation. B, Shortly after operation.

synechiae, and lymph exudation furnish their own indications. Treatment and diagnosis of secondary glaucoma is exceedingly difficult, and expert advice always ought to be sought. Another symptom Elliot refers to is gradual loss of sight without apparent cause, taking various forms, such as rapid increase in presbyopia, shrinkage of the visual field, reduction of the light sense, and reading with difficulty. It is never wise to dismiss any case with failing

vision; glaucoma (with what Elliot calls its triad of signs—cupped disc, failing field, failing central vision) may be far advanced. In considering differential diagnosis, Elliot gives cataract, refractive errors, brain tumour, optic neuritis, and optic atrophy as the things most likely to be confused with glaucoma. Cataract shows its well-marked sectors with a plus 10 to 12 spherical behind the sight-hole of the ophthalmoscope. If refractive errors are corrected and the vision is not normal, suspect some disease. Brain tumour and its optic neuritis can be diagnosed by means of the ophthalmoscope. Optic atrophy is perhaps the most difficult of all, and even specialists find great difficulty in deciding this point. Tobacco amblyopia is easily diagnosed by its paracentral scotoma. [A useful test is that put on the market by Weiss and introduced by ourselves.—J. B.-C.]. Where there is a gradual loss of sight with intermittent headaches, it is wise to look for signs of rising tension, and see the patient in the attack. After this passes off, examine his fields and discs. Various entoptic phenomena and haloes round lights are of importance. Regarding the latter, it is important to bear in mind that they occur in many other conditions than glaucoma, such as cataract, conjunctivitis, and irregular refraction.

Figs. 31, 32, 33, taken from Elliot's paper, show the different signs of changes in the visual fields. Fig. 31 shows Roenne's step and Bjerrum's sign. The latter is a scotoma starting from the blind spot, spreading round the central area of fixation, either above or below, and ending on a horizontal raphe on the nasal side; it has been described as sickle-shaped, but it really has a shape of its own. The lesion of which this sign is the evidence is believed to be injury of certain bundles of nerve-fibres by the sharp edge of the disc. Fig. 32, Seidel's sign, is the elongation up or down, or both, of the blind spot, ending temporally in pointed ends, and forming a figure, sometimes crescentic or moon-shaped, with its concavity towards the fixation point. Fig. 33 shows what Elliot has described as his own sign, elaborated by the use of his own scotometer or modification of Priestley Smith's circular method of plotting scotomatous areas. The figure shows how the blind spot presents jagged edges.

Herbert¹⁷ describes his improved iris-prolapse operation. Herbert's work, notably his flap sclerotomy, thread sclerotomy, and his broad iris-prolapse operation, should be studied by those interested in the glaucoma question. These operations he considers cover nearly the whole field of primary glaucoma, combining safety with efficiency. He lays down the rule tentatively (after going into the glaucoma question with a wealth of detail which only his extensive clinical experience could provide) that, in chronic primary glaucoma, no eye with continuous plus tension which can be relieved fully by eserine should ordinarily be operated on without preliminary miotic treatment, lasting for a period proportionate to the degree and probable duration of the tension; two or three months would be the maximum as far as could be judged from recurrences. The completeness or incompleteness of response to miotics may be of service as indicating the type of operation suited to individual cases. Certain it is that each case of glaucoma should be considered as a separate entity, and have treatment suited to it; in other words, each case requires separate and definite consideration.

REFERENCES.—¹*Ind. Med. Gaz.* 1919, liv, 294; ²*Amer. Jour. Ophthalmol.* 1919, ii, 60; ³*Arch. of Ophthalmol.* 1917, xlv, 332; ⁴*Amer. Jour. Ophthalmol.* 1917, July; ⁵*Ibid.* 1918, Feb.; ⁶*Ann. d'Oculist.* 1918, Feb.; ⁷*Amer. Jour. Ophthalmol.* 1918, March; ⁸*Arch. di Ottal.* 1918, March-Aug.; ⁹*Ophthal. Record*, 1915, March; ¹⁰*Ibid.* 1916, Aug.; ¹¹*Ann. d'Oculist.* 1916, Jan.; ¹²*Klin. Monatsbl. f. Augenh.* 1915, Nov.-Dec., 556; ¹³*Ophthal. Record*, 1916, Oct.; ¹⁴*Arch. of Ophthalmol.* 1916, Nov.; ¹⁵*Ibid.* 1917, No. 1, 1; ¹⁶*Brit. Med. Jour.* 1920, Feb. 28 and July 24; ¹⁷*Brit. Jour. Ophthalmol.* 1920, May.

GOITRE, SURGICAL ASPECTS OF. *Sir W. I. de C. Wheeler, F.R.C.S.I.*

For some years past an immense amount of attention has been given in America to diseased conditions of the thyroid gland, more especially with regard to toxic adenoma with hyperthyroidism, and true exophthalmic goitre. Heretofore these goitres were classified by various authorities into ill-defined groups. There were cases of goitres in highly neurotic girls where it was almost impossible to say whether the goitre was producing hyperthyroidism and nerve symptoms, or whether the latter were quite independent of the presence of the enlarged thyroid. Similarly a case of tachycardia with enlargement of the thyroid gland was diagnosed as a hyperthyroid condition in which many of the other classical signs of Graves' disease were absent. A group of border-line cases were the cause of much confusion amongst the most eminent diagnosticians. The question appears now to be definitely settled and all ambiguity has disappeared. Plummer, of the Mayo clinic, has repeatedly described a toxic adenomatous condition of the thyroid gland. In these conditions there is no change in the gland beyond changes which characterize adenoma; in other words there is no hyperplasia, and seldom exophthalmos. Toxic adenomata with hyperthyroidism may be therefore reasonably placed in a class by themselves, and not confused with hyperplastic toxic goitre, which gives rise to all the classical signs of Graves' disease. It should be noted, however, that there is a small percentage of cases midway between exophthalmic goitre and toxic adenoma in which hyperplasia is found in company with adenomata. The essential points in the clinical differentiation of exophthalmic goitre and adenoma with hyperthyroidism, as described by Plummer, are: (1) Enlargement of the thyroid is noted from 5 to 10 years earlier in life by the patients with non-hyperplastic goitre (adenoma) than by the patients with hyperplastic (exophthalmic) goitre. (2) The time elapsing between the appearance of goitre and the onset of the toxic symptoms differs considerably in each case. In toxic adenoma there is an average of 14½ years before symptoms of hyperthyroidism appear; in true exophthalmic goitre the hyperthyroidism appears soon after the enlargement of the gland, and averages nine-tenths of a year. (3) Exophthalmos usually accompanies the hyperplastic variety, and is nearly always absent in the adenomatous type. Exophthalmos usually follows quickly the appearance of hyperthyroidism (within two years in 87 per cent). Furthermore it will be found that there is a high blood-pressure in the adenomatous variety, which is absent in exophthalmic goitre. There is most likely a different etiology in the two diseases.

C. H. Mayo¹ states that exophthalmic goitre brings the patient for examination ten years earlier in life than does thyrotoxic adenoma. He states that a laboratory was opened in the clinic for the study of the chemical nature of the active principle of the thyroid gland. Thyroxin was isolated in 1914, and produced synthetically three years later. It was shown by Plummer in 1916 that the thyroid secretion is active in metabolism. This observation was followed by the estimation of the basal metabolism in all goitre cases. In toxic goitre the basal metabolism is greatly increased, and in myxœdema greatly diminished. There is no change in the metabolic rate in blood diseases, malignant disease, etc.; therefore an estimation of the basal metabolism is of great diagnostic importance both in the myxœdematous and hyperthyroid cases. By giving definite amounts of thyroxin intravenously or by mouth in the former class, it was possible to bring the basal metabolism to normal within given periods, and the rapidity with which the thyroxin was exhausted is shown. The results of treatment of hyperthyroid cases can be accurately checked by measurement of the metabolic rate.

Judd² lays stress on all these points. He shows that the activity of the thyroid gland is confined to the adenomatous growths in Plummer's disease instead of to the normally functioning part of the thyroid. He states that the psychoneurotic persons with tremor and tachycardia and enlarged thyroids are different, and the basal metabolic rate is always normal. In these cases surgery is of course contra-indicated. In true hyperplastic cases the toxic symptoms develop gradually and reach their climax after a few months; if the patient survives the attack, the toxic features gradually subside after a short period, although there is never a return to normal, and then there is another attack. Occasionally a spontaneous cure, with the disappearance of all evidence of the disturbance, occurs. The loss of body-weight is particularly important as an indication of the degree of toxicity. Surgical treatment must be deferred until the toxæmia is not progressive nor at the peak of a hyperthyroid wave. The pulse-rate, nervousness, and tremor are not of so much value in determining the time for active surgical intervention as loss of weight and loss of strength. The treatment of toxic adenoma is a somewhat different problem. Acute crises are not so apt to occur, and cardiac symptoms predominate. Primary thyroidectomy is the operation of choice, and may be done with a comparatively low mortality in the early stages of exophthalmic goitre; but in the Mayo clinic it was thought advisable to perform primary ligation in two-thirds of the cases. More than 65 per cent of the patients suffering from exophthalmic goitre were free from all evidences of the disease six years after operation. More than 80 per cent of patients with toxic adenoma can be relieved of their symptoms and a cure obtained by thyroidectomy.

Crile³ mentions some special points in the treatment of toxic goitres. He states that if after operation there is an excessively high temperature with greatly increased pulse and respiration, then, on the principle that heat increases chemical activity and electric conductivity, and that these in turn increase heat, such patients should be literally packed in ice, and packed early. This procedure has been found to exercise a remarkable control over the destroying metabolism. He states that this post-operative phase of exophthalmic goitre is closely analogous to heat-stroke in symptoms and in control. Heat-stroke and the so-called post-operative hyperthyroidism are the antitheses of surgical shock, in which by contrast the heat centre is functionally impaired. In the latter, heat is as useful as cold is in the former. Crile's mortality in each series of exophthalmic goitre cases treated by operation is 1 per cent. No cases presenting themselves were refused operation.

With regard to the use of the x rays, Frazier⁴ states that all the reports which he has seen deal in generalities, and do not give in detail the end-results. He fears, first, that the gland may be destroyed and a state of hypothyroidism produced if the treatment is pushed too far; secondly, that the toxæmia may be increased to a dangerous degree by the first treatment; and lastly, that the increase in connective tissue may make subsequent operation more difficult. He advocates primary ligation of the superior pole, and he surrounds the poles with two ligatures and divides all the tissues between; the resection should follow in less than two or three months. The maximum improvement from ligation is noted about that time. Primary ligation serves a useful purpose even although it is not followed by much improvement. The reaction of the patient to the minor procedure is a very good index of the degree of reaction that may be anticipated after the final thyroidectomy.

Freeman⁵ describes the technique of a tourniquet operation in toxic and other goitres. The necessary equipment (*Fig. 34*) consists of a number of ordinary strong rubber bands two or three inches long and somewhat thicker

than the lead of a pencil; two pieces of wire of a similar diameter three or four inches in length, with the ends turned over into small loops (large hairpins will suffice); and a small alligator forceps. When the lobes are dislocated in the usual manner, they are well elevated with the fingers. The alligator forceps is plunged into the base of the lobe near the centre and close to the trachea, and the rubber band is pulled through. The manœuvre is repeated through each extremity of the lobe, so that its base is now transfixed by the three loops.

The wires are passed through the loops and project well beyond the lobe at either end (*Plate XX, A*). The lobe is now elevated, and an assistant holds the ends of the wires together. The central band is pulled taut, binding the wires firmly together (*Plate XX, B*). *Fig. B*

also shows the arrangements of the two remaining bands wrapped about the projecting ends of the wires before clamping, so as to insure the constriction of the vessels at either end. An important point is that the elastic contraction of the rubber bands maintains the hæmostatic pressure of the wires even though much tissue is removed from between them. The author states that bleeding from the vessels is completely controlled. The projecting mass of goitre is removed by wedge-shaped excision (*Plate XX, C*).

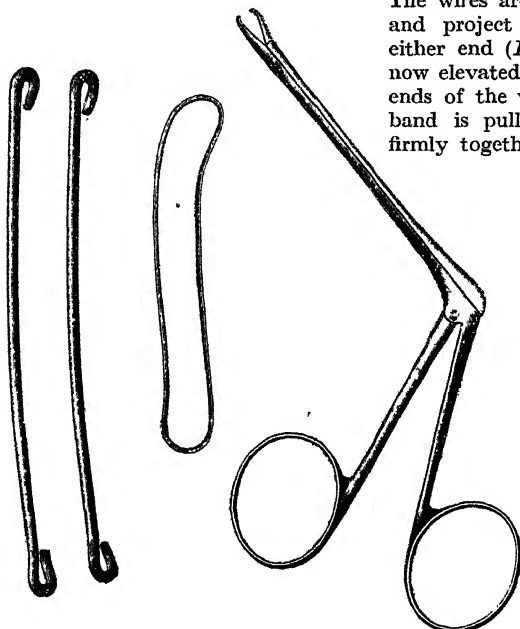


Fig. 34.—Showing wires, rubber band and alligator forceps.

Richter⁶ draws attention to the excessive reaction after operation for toxic goitre. It is due not merely to rough manipulation during operation, but also to initiation of an excess degree of activity in the portion of the gland left behind. The basic fault in the scheme of operation is the leaving behind of too much thyroid. The amount of thyroid necessary to the patient is very small. In toxic cases a very radical thyroidectomy offers the patient the best means of escaping the danger of immediate overwhelming intoxication.

Lahey⁷ states that from a personal experience of 300 thyroid operations he believes that preliminary pole-ligation is the one definite factor which makes the final operation of partial thyroidectomy less hazardous. The ligation of the superior thyroid poles brings about the interruption of the impulses reaching the gland from the superior cervical sympathetic ganglion; probably something short of one half of the blood-supply is immediately cut off. This probably influences greatly its functional activity.

It is the practice of the writer to send the patients home for eight weeks after double pole-ligation. He prefers ligation of the superior poles, because the nerves, vessels, and lymphatics are all constricted by one ligature. The operation of pole-ligation is performed as follows: Find the superior pole of

PLATE XX.

GOITRE

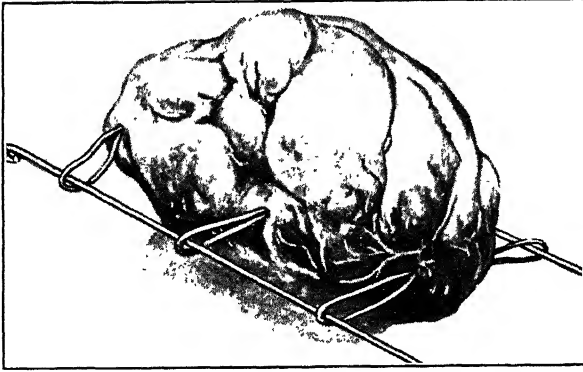


Fig. A.—Rubber bands drawn through base of lobe, and wires inserted through the projecting loops on either side.

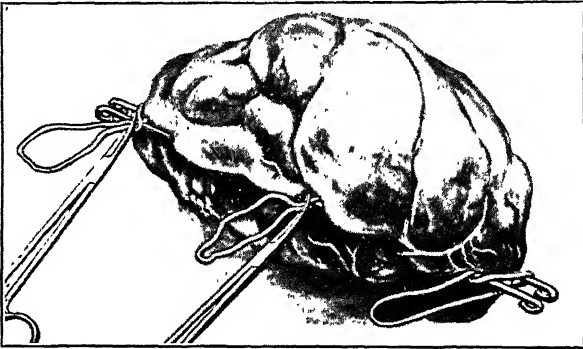


Fig. B.—Rubber bands drawn taut and held by forceps, the end bands having been wrapped around the extremities of the wires.

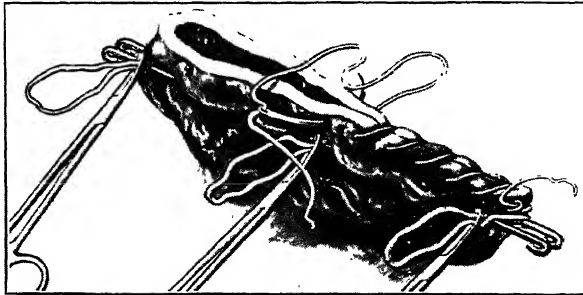


Fig. C.—Showing wedge-shaped excision and method of inserting hemostatic suture. (For the sake of clearness the 'cuff' is pictured unnecessarily wide and thick.)

Redrawn from the 'Annals of Surgery'

the thyroid by palpation, and just above this make a short transverse incision about $1\frac{1}{2}$ in. in length. Divide the platysma, expose the sternohyoid and the sternothyroid muscles; these muscles may be separated or divided. There is much troublesome venous bleeding, but with patience it is easily controlled. If the omohyoid is encountered it is retracted inwards, the sternohyoid outwards. The posterior branch of the superior thyroid which runs down over the back of the gland is included in the ligature.

Crile⁶ emphasizes the fact that complete team-play amongst the surgical, the anæsthetist, and the nursing staff is required; indeed this operation is not performed by the surgeon but by the hospital. The following are the principal factors in Crile's system:—

1. The differential diagnosis is greatly aided by the Goetsch test and metabolism determinations.

2. The operative procedures are graded according to the severity of the disease.

3. The inhalation anæsthetic is nitrous-oxide-oxygen, which is administered with the patient in bed; the operation being performed either with the patient in bed, or after his transportation, under anæsthesia, to the operating-room.

4. In moderate cases the entire operation may be completed at one séance.

5. In more severe cases the thyroid activity is diminished by a preliminary ligation with the patient in bed, under nitrous-oxide-oxygen analgesia and local anæsthesia.

6. In extremely grave cases it may be necessary to diminish the thyroid activity by multiple steps—ligation of one vessel; ligation of the second vessel; partial lobectomy; complete lobectomy—allowing intervals of a month or more between these stages, the length of each interval being determined by the degree of physiological adjustment.

7. If during the operation the pulse runs up beyond the safety point, the operation is halted, the wound dressed with flavine, and the operation completed after a day or two when conditions have again become safe. In some cases, even though the thyroid has been resected, it is advisable to dress the unsutured wound with flavine and make a delayed suture in bed the following day under analgesia.

8. In certain cases lobectomy is performed while the patient is in bed and under nitrous-oxide analgesia and local anæsthesia.

9. Psychic control of the patient on the part of the surgeon, the intern, the anæsthetist, and the nurse is required throughout to diminish the intense drive. An associated regimen should be prescribed for the pre-operative, inter-operative, and post-operative periods. The pre-operative and the post-operative management are of almost equal importance to that of the operation itself.

10. If, after the operation, the temperature becomes excessively high, with greatly increased pulse and respiration, the patient is packed promptly in ice.

11. To avoid the effects of too sudden a withdrawal of thyroid secretion, thyroid extract is given the night before a lobectomy.

Because of the striking benefits which follow the operation, and in view of the fact that a comprehensive surgical control yields a mortality rate of 1.1 per cent and excludes the rejection of any case on account of its gravity, he feels that the status of the surgical treatment of exophthalmic goitre is approaching that of the surgical treatment of acute appendicitis.

Treatment of exophthalmic goitre by **Radiotherapy** is discussed on p. 37.

REFERENCES.—¹*Ann. of Surg.* 1920, Aug., 139; ²*Ibid.* 145; ³*Ibid.* 141; ⁴*Ibid.* 155; ⁵*Ibid.* 161; ⁶*Jour. Amer. Med. Assoc.* 1919, Oct. 25, 1264; ⁷*Boston Med. and Surg. Jour.* 1919, Nov. 20, 618; ⁸*Surg. Gynecol. and Obst.* 1920, Jan., 27.

GONORRHOEA.

Colonel L. W. Harrison, D.S.O.

The work of the past year has advanced rather the general ideal of treatment than the treatment itself. It is a welcome sign that the necessity of making sure that the patient has been rendered non-infective, and of not being content merely with the disappearance of uncomfortable symptoms, has been expressed in the careful descriptions of their standards of cure which many authors have included in their articles on gonorrhœa. It is evident, too, that in response to propaganda the general public is inclined to regard gonorrhœa more seriously than formerly. Allowing for the fact that the increasingly serious view of gonorrhœa now being taken by the public must create a certain proportion of 'venereophobes', its general effect on the public health must be good, since failure on the part of the patient to continue treatment largely nullifies the value of the treatment to the public health. The attitude of the public towards this disease is still, however, far from ideal, as is shown by the high proportion of patients who discontinue attendance at public clinics before even gross signs have disappeared. That gonorrhœa is still regarded too lightly is shown also by the low proportion of gonorrhœal to other venereal cases in those patients who apply for treatment to V.D. clinics under the Ministry of Health scheme. Thus, in 1918 the cases of gonorrhœa were 17,685 (38 per cent) out of a total of 45,353 new cases of syphilis, gonorrhœa, and soft chancre, and in 1919 the gonorrhœa cases numbered 38,500 (46 per cent) out of a total of 82,870.¹ In contrast with these proportions, an analysis by the reviewer of a random sample of 21,591 admissions to military hospitals in France during the war showed 15,377 (71 per cent) to have been cases of gonorrhœa. Clearly, the military figures are more nearly a correct index of the proportion of gonorrhœa to other venereal diseases, since treatment is compulsory in the army. It is satisfactory, however, to note that the proportion of gonorrhœa cases in civil V.D. clinics rose substantially in 1919. The writer has always held that the medical profession, by the individual exhortations of its members, can do immense good in the direction of inducing the general public to take a correct view of the importance of venereal cases being rendered non-infective. The aim of the Ministry of Health scheme of free treatment at V.D. clinics is to break the chain of infection by rendering the greatest possible number of infected no longer carriers of infection. Obviously the scheme fails wherever the patient is discharged from a clinic still harbouring gonococci. The notorious elusiveness of the gonococcus makes the decision of cure dependent on a large array of negative evidence. The stricter the tests of cure imposed by the medical adviser of a gonorrhœal patient before permitting him to cease attendance, the more the public health is served. In the past there has been no uniformity in tests of cure of gonorrhœa, and there can be no doubt that very many cases have been discharged whilst still carriers of infection, because their medical advisers have not possessed a clear idea of the tests which ought to be imposed before arriving at the opinion that the gonococcus does not still lurk in some recess of the genital passages. In order more certainly to secure its object of staying the spread of venereal disease by rendering patients non-infective, the Ministry of Health issued a memorandum in 1919 setting out a standard of cure, which is admittedly severe, but no less than could be demanded in the present state of knowledge by the custodian of the public health, who is not interested so much in the patient's discomfort as in the fact that he is a menace to the public health. The tests of cure set out in Memorandum No. 21 of the Ministry are briefly as follows:—

Males.—After suspension of all treatment and resumption of normal habits, in spite of provocative treatment, including bougies, instillation of 1 per cent silver nitrate, and injection of vaccines, one or more of which should be applied

weekly, three examinations at weekly intervals should reveal absence of (a) urethral discharge (or at most a very slight, transparent one containing no gonococci); (b) urethral infiltrates on palpation over a metal sound; (c) gonococci in films made from threads in urine, and from prostatic secretion. A urethroscopic examination should also be made, and cultures from secretion expressed from the urethra, including the prostate and the seminal vesicles, and the blood tested for complement-fixation with a gonococcal antigen.

Females.—The tests are carried out at monthly intervals, preferably just before or after menstruation. Cultures of secretion and complement-fixation tests of the blood are advised as in the case of males. Provocative vaccine is recommended, and the irritant applied to the cervical canal to provoke secretion in which gonococci may be found is 15 per cent silver nitrate. Secretion is obtained on each occasion from the urethra, the cervix, and, if possible, Bartholin's glands. The urine is examined as in males.

GONORRHOEA IN WOMEN.—The treatment of gonorrhoea in women is notoriously unsatisfactory, and the British Medical Association met a generally-expressed wish in devoting part of one day's discussion at its annual meeting in 1920 to this subject. The opinions expressed as to the correct treatment were, as Walker remarked, very diverse.² Dr. M. Rawlins, who opened the discussion, employs a variety of remedies, including silver preparations such as **Protargol** (10 per cent), **Eucalyptus Oil** in olive oil (40 per cent), and **Picric Acid** in glycerin (50 per cent). She prefers the last, which is applied to the affected parts two or three times a week. Care should be taken not to leave a pool of the picric in the vagina. If the patient becomes jaundiced from absorption of the picric acid, this is discontinued. If daily packing is not possible, pessaries of 10 per cent **Protargol**, or of **Sauerin**, are inserted at home. She does not advise home douching unless there is disease of the adnexa, when the local application of heat may be valuable. In such cases the patient should lie on her back, with the buttocks slightly raised, and the douche-can should be not more than 18 inches above the body level. **Vaccines** are valuable, but in cases of salpingitis and ovaritis should be given cautiously. Skene's ducts are easily washed out with a syringe armed with a blunt-ended needle, employing silver nitrate. If this fails, they are incised and cauterized, or treated with iodized phenol or protargol.

Amand Routh recommended strong applications to the whole generative tract, more especially in the newly married, as a preventive of salpingitis. K. Walker had obtained encouraging results by **Diathermy**, though electrical methods had, in his opinion, failed lamentably in male gonorrhoea. Harrison considered the treatment of gonorrhoea in women to be largely a question of drainage of a dead end, and urged the importance of assisting nature to eliminate the poison from the deeper tissues. For this reason he deprecated the use of caustic applications, and favoured rather the use of **Glycerin**. He advocated the employment of cultural methods as a test of cure, since microscopical methods often failed to detect the gonococcus when cultures were positive. Dr. Rawlins, in replying, expressed a favourable opinion of the complement-fixation test in diagnosis and in deciding as to cure.

Kapferer³ has tested the method, recommended by Weiss, of giving the patient very hot baths, on the principle that the gonococcus is very sensitive to heat. After fifteen minutes' immersion at 100°, the temperature of the bath was gradually raised to 110° or even to 114°, the total time spent being about an hour. The patient's temperature frequently rose, as a result of the immersion, to 104.4°, and sometimes even to 109°. Uncomfortable side-effects were frequent. The treatment was combined with **Choleval** applications. The results in ten cases were not encouraging.

Block⁴ details his routine treatment. Internally he administers **Oleum Santali** 10 min., t.d.s., and a mixture of **Tinctura Hyoseyami** 5 min., **Sodii Bromidum** 10 gr., and **Liquor Potassii Citratis** 1 drachm. For *urethritis*, 15 per cent **Silver Nucleinate**, or 5 per cent **Silver Nitrate**, is applied every third day to the whole length of the canal with a cotton-wool swab, after the patient has urinated and the canal been dried. For *cervicitis*, hot douches of 1-8000 **Potassium Permanganate** are given four or five times a day until the discharge has considerably lessened. Local applications are made two or three times a week. After thorough douching the canal is dried, mucus removed by swabbing with liquor antisepticus alkalinus, and, after drying again, 10 per cent **Silver Nitrate** is applied as far as the internal os, followed immediately by **Tincture of Iodine**. Silver iodide is formed in the cervical canal. The whole canal and vagina are thoroughly dried and the speculum is withdrawn. After three weeks of this treatment the condition has usually so improved that douches can be discontinued and the intervals between local applications prolonged.

Sicilia⁵ remarks on the difficulty of treating gonorrhœa in the female. He obtained the best results by: (1) Douching with 1-4000 to 1-2000 potassium permanganate, to which are added after the first week 20 drops, increasing progressively to 100 drops, of silver nitrate solution (5 per cent); after the thick discharge has been washed off, the point of the cannula is directed against the cervical orifice, or even inserted into it; the lavage is continued until the vaginal wall becomes brown. (2) If the cervical mucosa is pouting, silver nitrate (10 per cent) is applied, and the cervix and vagina are finally swabbed with 5 per cent potassium permanganate. (3) The urethra is irrigated with permanganate, alone or combined with methylene blue or silver nitrate, and then injected with about 10 c.c. of a 5 per cent solution of **Argyrol** or **Protargol**. If the discharge has not abated after some days, a few drops of 10 per cent silver nitrate are added to the organic silver solution.

Dorland⁶ asks for a careful trial of the application of 1 per cent **Methylene Blue**, for which it is claimed that it is non-irritating and even analgesic, is followed by marked clinical relief in thirty-six to forty-eight hours, and causes rapid decline in the number of gonococci. It is also claimed that the results generally are greatly superior to those obtained by routine methods.

R. S. Foss⁷ has employed the following solution: methylene blue 1, glycerin 25, water 100. A gauze plug soaked in this solution was packed lightly round the cervix, leaving the remainder of the gauze, 12 in. by 2 in., lying lightly in the vagina. The plugs were applied thus for five days, and dry plugs for two days in each week. He claims that erosions healed quickly, discharge soon stopped, and the treatment is painless. [It is possible that a considerable portion of the credit may be due to the glycerin.—L. W. H.]

Graebke⁸ records the results of treatment by intravenous injections of **Collargol** in combination with local applications. A series of 22 cases was treated on these lines in parallel with a similar number treated by local applications only. The local treatment in both series consisted of bougies of 5 per cent silver nitrate, or some organic preparation of silver inserted into the cervix with forceps, and retained there by tampons soaked in the same solution. The urethra was treated with applications of 1 to 5 per cent silver nitrate after swabbing with mercury perchloride. Hot douches and sitz baths were also employed. The 'collargol' series received, every other day, intravenous injections of collargol, increasing from 2 to 8 c.c., **Dispargen** 5 c.c., or **Electrargol** (Heyden) 10 c.c. If the injection caused a severe reaction in the form of high fever, the interval was increased. The standard of cure was very severe. The treatment was continued for four weeks after the last negative

microscopical finding, a slide being examined every second day. After stopping treatment, a slide was taken every third day. If still negative, an injection of 'Gonargin' (0.5 to 1.0 c.c.) was given intravenously, and the secretion searched for gonococci on each of the next three days. Then, following menstruation, Lugol's Solution (iodine 1, potassium iodide 2, water 1 oz.) was applied. If after this the slide remained negative for eight to ten days, the patient was classed 'clinically cured', and put under observation for six months. The results showed that the intravenous injections reduced the duration of the disease from commencement of treatment to 'clinical cure' in uncomplicated cases from 11 weeks to 6.5, and in complicated cases from 11.5 weeks to 11.

Romeick⁹ employed intravenous injections of 2 to 11 c.c. of 2 per cent collargol with beneficial results. The reactions may be severe, and the author would reserve the treatment for robust patients.

Rudolph Klien¹⁰ has tried the numerous Water-soluble Bougies which have been recommended recently as applications to the urethra and cervical canal, including gonostyli, caviblen, and choleval bougies, particularly the two last. Gonostyli contain too little silver (1 per cent protargol and 0.1 per cent ichtthargan) to be of value in gonorrhœa of females. Caviblen and choleval are put up in much too hard a covering (hollow gelatin tube) or base, and cause pain, whilst they are frequently expressed from the uterus before they have dissolved. He recommends, therefore, the base he published in 1898, as follows:—

R	Sacch. Alb. Subtil. Pulv.	5.0	Pulv. Tragacanth.	
	Sacch. Lact.		Glycerin.	q.s.
	Pulv. Gum. Arab.	āā 1.7		

To make 12 bougies 7 cm. long and 0.4 cm. thick.

The glycerin and tragacanth are employed in such quantity as will make the bougie stiff enough and yet sufficiently flexible. The medicament—protargol, ichtthargan, caviblen, choleval, or uranoblen—is incorporated in the above medium in a strength of 10 per cent. After the acute stage has passed he inserts daily for eight to fourteen days a half bougie into the cervical canal. When the discharge at the end of the time has become non-purulent, a whole bougie is inserted, since the author believes that, in the majority of cases, the infection travels beyond the internal os. The bougies are apt to cause pain in the urethra, and the author injects, with a Banttner's ointment syringe, a glycerin ointment (ung. glycerini Ph. G.) containing 10 per cent of an organic silver preparation. [Hare gives, as a useful formula for glycerin ointment, 1 of potato starch and 15 of glycerin.—L. W. H.]

GONORRHOEA IN CHILDREN.—Schulz¹¹ has tried the Weiss method of hot bathing in 20 cases of vulvovaginitis, and abandoned it on account of the severe side-effects produced—violent headache and abdominal pain. The temperature of the baths commenced at 100.4°, and was raised to 104° to 111°, each immersion lasting twenty to thirty minutes unless the child succeeded in its violent efforts to get out of the bath.

F. B. Bland¹² reviews the question of gonorrhœa in children. As to frequency, he quotes Norris, who states that gonococci were found in 63 per cent of all cases of vulvitis in the Johns Hopkins Dispensary, and other writers who place the proportion at 85 per cent. Hamilton found that 4 per cent of all applicants for admission to the Babies' Hospital in New York were suffering from this disease. The methods of infection are by clinical thermometers, bath water, towels, napkins, etc., but parturient infection is uncommon. The majority of the cases were between 2 and 10 years of age (average 5.1 years). The chief symptom, besides the discomfort from itching and burning, is the thick yellow or yellowish-green discharge, with excoriation of the vulva. The

disease frequently reaches the cervix, but the uterine cavity is very rarely infected. The author emphasizes the importance of gaining the child's confidence by not hurting her, and treatment is confined at first to copious cleansing of the parts twice daily by douching with warm water or boric lotion through a soft catheter. After a few days **Lugol's Solution** is added (15 min. to two quarts of water), increasing the strength gradually to 1 per cent. Once each day 25 per cent **Argyrol** solution is instilled into the vagina and the vulva is painted with the same solution. After the local application a cotton-wool pad soaked in 25 per cent argyrol is placed between the labia. After about six weeks the irrigations are reduced to once daily, but the local applications are continued.

Wachs and Mazer¹³ strongly recommend the use of **Dakin's Oil** in the treatment of chronic vulvovaginitis of children. The child is placed in the partial Trendelenburg position, and, after the vulva has been cleansed with boric lotion, the oil is dropped into the vagina with a medicine dropper of 2 drachms' capacity. By this treatment, applied every other day, 39 patients out of 45 were discharged cured in four months, the remaining 6 still showing some pus cells. In acute cases 1 per cent oil was found rather irritating, and 1 per cent Dakin's solution was substituted. Chronic cases tolerate 1 per cent Dakin's oil quite well. Of the 39 cases observed for seven to eight months, 4 relapsed in one to four months after their discharge. The authors record that Dr. Michelberg treated 20 cases of chronic gonorrhoeal vaginitis at the Children's Hospital, and in nine weeks was able to discharge 12 of them.

GONORRHOEA IN MALES.—McDonagh¹⁴ recommends the following treatment of acute gonorrhoea. Intramuscular injections of 0.5 c.c. **Colloidal Palladium** (**Pallamine**) on the first and fifth days, and of 0.5 c.c. **Trimine** (colloidal manganese with colloidal iron and a trace of colloidal zinc) on the twelfth and nineteenth days; alternatively three injections of pallamine at weekly intervals. Treatment is supplemented by alkalis and aperients internally, and irrigation with **Potassium Permanganate** (1-10,000) or with **Trypaflavine** (1-4000). If the discharge still persists after this, or a complication such as prostatic abscess or epididymitis supervenes, two injections of 2500 million and one of 5000 million detoxicated **Vaccine** are given every second day. If still acute or subacute after this, two injections of trimine (0.5 c.c. and 1.0 c.c.) are given at weekly intervals. If chronic by this time, 1.5 c.c. **Intramine** is injected, and, a week later, 1.5 c.c. trimine. McDonagh claims that, if the above treatment were commenced in all cases while the disease was anterior, gonorrhoea would cause no more inconvenience than a mild cold in the head. For recurrent cases he recommends a commencement with three injections of detoxicated vaccine, followed by a rest of ten to fourteen days. If after this a subacute lesion of the urethra, prostate, or seminal vesicles is found, two trimine injections (0.5 and 1.0 c.c.), one or two of intramine (1.5 c.c.), and one of trimine (1.5 c.c.) are given at weekly intervals, with colloidal iodine internally. In chronic cases three intramine injections are followed by one trimine (1.5 c.c.), with colloidal iodine internally. The author does not state by what tests he determines that the patient is no longer infectious.

A. H. Crosbie¹⁵ details his routine treatment of gonorrhoea. In chronic cases he has given up applications through the urethroscope and instillations of silver nitrate, but relies on (1) bi-weekly **Prostatic Massage**; (2) bi-weekly anterior and posterior irrigation with **Silver Nitrate** 1-4000; (3) very gradual dilatation of the posterior urethra up to 38 French. The dilatation is employed once weekly, and the advance at each sitting is only one degree. The dilatation is followed by irrigation into the bladder with silver nitrate, 200 c.c. being left in the bladder while the prostate is massaged. [The reviewer

can testify to the value of this method, but would limit the strength of the silver nitrate to 1-10,000.—L. W. H.]

Corbett and Osmond¹⁶ tested detoxicated **Vaccines**, prepared according to Thomson's method, on 123 cases of gonorrhœa, employing as controls 64 similar cases treated locally exactly as the test cases. The injections were given every fifth day in doses of the following thousands of millions, 5, 5, 7·5, 7·5, 10, 10, and 15. The results showed that, of the 123 vaccine cases, 6 developed complications, against 10 in the control series. The average duration of the disease before commencement of treatment was 4·2 days in the vaccine and 3·5 in the control, and the duration of the disease to final disappearance of all signs, clinical and bacteriological (counting the duration of relapses), was 38·5 and 48·4 days respectively, a gain of about ten days for the vaccine series. There were 6·5 per cent relapses in the vaccine series and 4·7 per cent in the control. Contrary to the finding of Thomson and Lees, the clinical improvement did not run *pari passu* with the complement-fixing power of the serum. Thus, out of 121 vaccine cases, 64 were negative at the end of the treatment, and the duration of the disease averaged 38·9 days; while that of the 57 cases which gave a positive complement-fixation reaction at the end of treatment was 38·7 days.

Boas and Thomsen¹⁷ have employed vaccines in early cases to prevent complications. The complications in 126 cases were 23 (19 per cent), including 15 posterior urethritis, 3 prostatitis, 2 peri-urethral infiltrate, 1 lymphangitis, and 2 epididymitis. In the records of 202 cases not treated with vaccines it was found that 45 per cent had developed complications, including 11 per cent epididymitis. The vaccine appears, therefore, to have acted as a prophylactic of complications. Those which did develop ran a milder course.

The use of **Mercurochrome 220** advised (*p.* 15).

COMPLICATIONS OF GONORRHOEA.—Numerous authors confirm the good results which follow in gonococcal complications, the injection of such foreign substances as **Antityphoid Vaccine**, mentioned in the *MEDICAL ANNUAL*, 1920, *p.* 157. Reenstierna¹⁸ has employed this method to enhance the effect of his antigenococcal serum in 100 cases of complicated gonorrhœa, including arthritis, epididymitis, and prostatitis, with excellent results. The vaccine is given with the object of inducing fever, on the principle that gonococci are rendered more sensitive to attack by subjection to a high temperature.

Debré and Paraf¹⁹ have treated 15 cases of arthritis by tapping followed by intra-articular injection of **Antigonococcal Serum**, equal to half the quantity removed. The injections were repeated two or three times at intervals of a day or two. In 6 cases a cure followed in a week, and in 8 others within fifteen days; in 1 case no benefit followed. The treatment is based on the effect of intrathecal injections of meningococcal serum in cerebrospinal meningitis, and on animal experiments, the injection of antigenococcal serum into rabbits' eyes having rapidly cleared up the lesions produced by previous inoculations of the eye with gonococci.

Langeron and Bocca²⁰ have obtained good results in gonococcal arthritis from the injection of massive doses of antigenococcal serum. The dose should not be too small, and for acute cases the authors recommend an injection of 40 to 60 c.c. every day for four days. In milder cases the dose should not be less than 100 c.c. [In view of the excellent results recorded by various workers which have followed the injection of massive doses of normal horse serum in other infections, it is possible that as good effects as those recorded by Langeron and Bocca above would follow from the use of normal horse serum in gonococcal arthritis.—L. W. H.]

The employment of **Colloidal Sulphur** is discussed on *p.* 10.

McDonagh²¹ says there is hardly any condition met with in medicine which responds so quickly to treatment as gonococcal arthritis does to **Intramine**. A dose of 1.5 c.c. is injected intramuscularly at once, the same amount in three days, and 2.5 c.c. a week later. The action is enhanced by the intravenous injection of 100 c.c. colloidal iodine the day before the intramine is given. In subacute cases colloidal iodine may be given internally (3 drachms thrice daily) for two weeks before the intramine.

Lévy-Bing and Durcœur²² have obtained good results in gonococcal arthritis and epididymitis from three to five intravenous and subcutaneous injections of **Sulfarsenol**, 0.06 to 0.18. In severe cases the dose may be increased to 0.3 or 0.36. F. C. Doble²³ records similar results in epididymitis from the intravenous injection of 0.12 and 0.18 gm. sulfarsenol at an interval of two days. The day after the second injection all pain and tenderness had usually disappeared.

G. Eisel²⁴ has treated thirty cases of epididymitis by intrascrotal injections as suggested by R. Müller²⁵ and by I. Sandek.²⁶ Eisel employed physiological salt solution, of which 10 to 15 c.c. were injected into the lower pole of the scrotum between it and the tunica vaginalis. The relief of pain from thus surrounding the testicle with a water bed, as the author thinks, was very rapid and well justifies the treatment, but there was no marked effect on the size of the swelling. Müller used the patient's own serum in the same manner.

Trossarello²⁷ treated 45 cases of gonorrhœa and 15 of bubo with intramuscular injections of 5 to 10 c.c. Milk at intervals of three to four days. No benefit resulted in cases of urethritis, prostatitis, epididymitis, and arthritis, but in 20 cases of salpingitis and ovaritis the results were strikingly good. The injections are succeeded by febrile reaction, and the best results follow the strongest reactions.

Fraser and Duncan²⁸ employed intravenous injections of gonococcal and other **Vaccines** with marked benefit. F. Van den Branden²⁹ speaks highly of the use of gonococcal vaccines in gonorrhœal complications, especially epididymitis, but prefers intramuscular to intravenous injections, because the latter failed more often in his hands. His records show, however, that when the intravenous injection was followed by improvement, this was more rapid. The vaccine employed was the gono-vaccine of the Pasteur Institute of Brabant.

TESTING FOR CURE.—E. F. Müller³⁰ considers that the injection of irritants into the urethra and the passage of sounds with the object of provoking a discharge in which to search for gonococci are unnecessary, and may retard the patient's recovery by damaging the tissues. Vaccines, specific and non-specific, have the disadvantage of causing general reaction, and a better method is to give an intradermal injection of a solution of casein known as 'Aolan'. With a very fine needle, 0.2 to 0.3 c.c. is injected into the skin in two places so as to produce wheals. An increase of urethral discharge follows, in any case, the following morning. This is searched for gonococci, and the author claims that the search is successful much more often after provocation by the intradermal method than any other.

W. Magner³¹ has tested the complement-fixation test as described by Thomson in the *Medical Research Special Report Series, No. 19*. In all 300 sera were tested, employing the antigens of Parke, Davis & Co., and of Thomson, both of which were good, though Parke, Davis & Co. was more anti-complementary than Thomson's and apparently rather less sensitive. The group comprised 90 'controls', of which 4 gave a positive result. One of these had suffered from gonorrhœa eight years previously, the other three denied gonorrhœa; all four were suffering from syphilis. The following positive results were obtained: In 51 cases of acute gonorrhœa tested after the twelfth

day, 88 per cent. In 20 cases after the fourth week, 95 per cent. In 6 cases with metastatic complications, 100 per cent. In 10 cases between second and fifth month, 7 positive and 2 doubtful. In 2 cases of urethritis probably non-gonococcal, none positive. In 3 cases treated with vaccines within three months, 2 positive, 1 doubtful. In 2 cases treated with vaccines more than three months previously, none positive. Two apparently cured cases tested within two months of cure were both positive. Five similar cases tested more than three months after 'cure' gave negative reactions.

The author concludes that: (1) With a good antigen, most cases of gonorrhoea are positive after the twelfth day and some as early as the fourth day; (2) The administration of vaccine during the course of the disease does not result in longer persistence of the reaction than in cases not so treated; (3) The reaction dies out three months after cure.

Dixon and Priestley³² consider that the complement-fixation test is of definite value in prognosis, no case being justifiably regarded as doing well until it has given a strongly positive reaction. From this point, which is attained in fresh cases in the ninth or tenth week if they are progressing favourably, the strength of the reaction declines; in second or later attacks the acme is not reached until about the fourteenth week. A single negative result is of no value in diagnosis, but the same result two or three weeks later is strongly presumptive evidence of absence of infection.

Detoxicated vaccine raises the strength of the reaction, but this rise does not necessarily indicate an improvement in the patient's condition. The last conclusion is contrary to the finding by Thomson³³ that a rise in the complement-fixation power of the patient's serum under detoxicated vaccine therapy proceeds *pari passu* with clinical improvement.

REFERENCES.—¹*Annual Report of Chief Medical Officer. Ministry of Health, 1919-20*, 156; ²*Brit. Med. Jour.* 1920, ii, 194; ³*Wien. klin. Woch.* 1920, v, 107; ⁴*Amer. Jour. Med. Sci.* 1920, April, 572; ⁵*Siglo méd.* 1920, lxvi, 1079 (abstr. in *Surg. Gynecol. and Obst.* 1920, July, 50); ⁶*Med. Record*, 1920, Aug. 14, 268; ⁷*Brit. Med. Jour.* 1920, ii, 434; ⁸*Deut. med. Woch.* 1920, xlv, 34; ⁹*Centralb. f. Gynäkol.* 1920, June 5; ¹⁰*Münch. med. Woch.* 1920, xxxvii, 1069; ¹¹*Arch. f. Kinderh.* 1919, lxvii, 429; ¹²*N. Y. Med. Jour.* 1920, March 20, 489; ¹³*Ibid.* June 5, 997; ¹⁴*Practitioner*, 1920, Jan., 14; ¹⁵*Boston Med. and Surg. Jour.* 1920, clxxxii, 116; ¹⁶*Lancet*, 1920, ii, 346; ¹⁷*Hospitalstidende*, 1919, lxii, 1185; ¹⁸*Svenska Läkarsällskapets Handlingar* (abstr. in *Jour. Amer. Med. Assoc.* 1920, Aug. 21, 578); ¹⁹*Bull. Soc. méd. Hôp. de Paris*, 1919, xliii, 908; ²⁰*Lyon chir.* 1920, May-June, 362; ²¹*Practitioner*, 1920, Jan., 14; ²²*Ann. des Mal. vén.* 1919, xiv, 655; ²³*Lancet*, 1920, ii, 243; ²⁴*Münch. med. Woch.* 1919, Aug. 15, 931; ²⁵*Wien. klin. Woch.* 1917, xxvi; ²⁶*Derm. Woch.* 1918, xxii; ²⁷*Jour. Amer. Med. Assoc.* 1920, June 26, 1802; ²⁸*Lancet*, 1920, i, 248; ²⁹*Arch. méd. Belges*, 1920, ii, 99; ³⁰*Münch. med. Woch.* 1920, i, 9; ³¹*Lancet*, 1920, ii, 123; ³²*Ibid.* 1919, ii, 984; ³³*Ibid.* i, 1102.

GOUTY JOINTS. Use of Paraffin-wax Baths in treatment of (p. 16).

GRANULOMA VENEREUM.

E. Graham Little, M.D., F.R.C.P.

Hoffmann¹ contributes a long and important paper on this subject, with specially careful bacteriological data. The disease is almost restricted to a venereal disease, and affects both sexes, Europeans as well as natives. The initial lesion is a blister, usually on the genitals, groin, perineum, or thighs. The ulceration which results from the blister may spread extensively, and invade the mucosa of the rectum, in which event stricture is probable. In women the vagina may be ulcerated and fistulas into the rectum result. The glands in the groin are commonly enlarged, but do not often ulcerate. The organism which is responsible for the disease, the 'round bodies' as they are often called, are capsuled bacteria, which may be enclosed in connective-tissue cells in large numbers. They are Gram-negative, stain a dark violet or red with Giemsa, the capsule remaining pink. The bacterium is a double

coccus or rod with accentuated polar staining. It can be grown on very numerous media, it sours milk, and liquefies gelatin. Cultures may remain active for six months. Inoculation experiments with guinea-pigs, rats, and rabbits proved the organism to be extremely virulent to these animals.

TREATMENT.—In early cases **X Rays** proved a satisfactory treatment, but intravenous injections of 60 to 120 c.c. of a 1-1000 solution of **Tartar Emetic** is the method recommended by the author; eight to fifteen injections may be required, given at intervals of two to four days.

Goodman² describes four cases as seen by him in Porto Rico. Two were negroes and prostitutes, and in both the symptoms were similar, papillomatous excrescences appearing about the vulva and perineum, ulcerating, and resistant to treatment. The third case was a male mulatto, in whom the disease had begun on the scrotum as an ulcer which had spread round the anus. The fourth was a discharged soldier, in whom the first symptom was an ulceration in the intergluteal fold. In the first case a spirochete was found in the smears; in the other three cases an organism identified with *Calimato-bacterium granulomatis* was demonstrated. The organism was found within large mononuclear cells grouped in a circle of eight or ten organisms. Each germ was inside its capsule, which remained unstained. Each organism was longer than it was broad. No nucleus was distinguishable. Extracellular bacteria were also seen which corresponded to the descriptions given by de Souza Araujo. The resemblance to a dividing bacillus or to a diplococcus was marked. These organisms are much smaller than the intracellular type. The relation of the intracellular and extracellular organisms is assumed to be one of adult and immature forms, but this requires further study. In each of the three cases the extracellular form was found associated with the large intracellular type. Occasionally extracellular examples of the large organism were found also.

TREATMENT.—Antisyphilitic treatment does not affect the disease. Neither salvarsan, mercury, nor potassium iodide alleviates the condition. The drug recommended is **Antimony** and **Potassium Tartrate** (tartar emetic). First advocated by the Brazilians, tartar emetic has taken first place in the treatment of the disease. It is used intravenously, and by oral administration.

Intravenously, it is ordinarily given in a concentration of 1-100. The solution should be prepared in distilled or redistilled water, and in the cold, as heat decomposes the tartar emetic immediately. The dose is 5 c.c. of the 1-100 solution, every second day. Ashford writes of increasing the dose gradually to 12 c.c., every second day.

The prescriptions recommended for oral administration are:—

R	Antimonii et Potassii Tar-		Glycerini	5j
	tratis	gr. iv	Aquæ Chloroformi	5j
	Sodii Bicarbonatis	gr. xxx	Aquam	ad 5ij
	M. Sig.: One to two drachms in water three times a day.			
R	Antimonii et Potassii Tar-		Glycerini	5ij
	tratis	gr. viij	Aquam Destillatam	ad 5j
	Phenolis	℥x		
	M. Sig.: Fifteen minims every two days.			
R	Antimonii et Potassii Tar-		Potassii Iodidi	5j
	tratis	gr. j	Glycerini	5ij
	Sodii Bicarbonatis	gr. xv	Aquam	ad 5j
	Sodii Salicylatis	gr. x		
	M. Sig.: One drachm in water three times a day.			

Röntgen Rays have been used successfully, but not universally so.

REFERENCES.—¹Munch. med. Woch. 1920, Feb. 6, 159; ²Arch. of Dermatol. and Syph. 1920, Feb., 151.

PLATE XXI.

LARGE COMPACT HÆMANGIOMA OF THE NECK



By permission of the 'British Journal of Surgery'

HÆMANGIOMATA AND LYMPHANGIOMATA.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Hæmangiomata.—The literature dealing with this subject is scanty, and the descriptions are often misleading and erroneous. The tumours have, for example, a much greater tendency to infiltration of the surrounding tissues and to the development of metastasis than is usually recognized. The term *navus* strictly means a mole or natural mark, and these are classified by some as melanomas. The growth of a hæmangioma, arterial or capillary, may become arrested and a spontaneous cure result by a process of fibrosis; it may continue to grow by a process of infiltration of the surrounding parts; the type may change from capillary to cavernous. A spontaneous cure probably depends on contraction of the stroma of dense fibrous tissues, with a consequent diminution of the blood-supply. Fraser¹ deals with this point, and mentions a case of hæmangioma occurring in the breast which repeatedly recurred after excision, and which finally produced metastasis in the lungs. He describes the compact type of hæmangioma (*Plate XXI*), the development of which is accompanied by a localization of the tumour. There is a definite capsule of fibrous tissue encircling the mass, and from the outer envelope septa extend inwards, breaking up the tumour into lobules. Fraser comes to the following conclusions: (1) Hæmangiomata constitute the most common variety of all the tumours which are met with during the period of childhood; (2) The tumours are congenital in origin, arising in all probability from 'rests' of embryonic vascular tissue; (3) The further development of the tumour leads to the formation of capillary, cavernous, and compact varieties; (4) The tumour has striking powers of infiltration, and occasionally it may give rise to metastasis.

TREATMENT.—Small angiomas of the face in a child are probably best dealt with by electrolysis, under general anaesthesia. The application of 'dioxide' snow is followed by success in the larger types. The point of a snow candle is applied for a few seconds to the part to be treated. Frequently it is necessary to ligature the branches of the external carotid artery. The main vessel is first exposed and the branches identified. Ligature of the main artery is useless, as collateral circulation is rapidly established. Ligation of the vessels feeding the tumour should be followed by injections, such as equal portions of alcohol, glycerin, and formalin (90 per cent)—Morestin. A long fine needle is pushed into the depths of the tumour, and the solution injected drop by drop as it is withdrawn. No solution must be injected immediately under the skin. There is a very sharp local reaction a few hours after the injection, which persists for some days. If excision can be safely undertaken, it is the best treatment for angiomatous tumours, but it is often too dangerous, and is followed by disfigurement. Angiomas of the scalp in the region of the fontanelles often communicate with the longitudinal sinus, and the cavernous variety often penetrates the skull.

Lymphangiomata: Results and Feasibility of Treatment with Injections of Boiling Water.—Francis Reder² has so far injected eight patients with boiling water. The reaction following the injection seemed unusually severe when compared with the reaction following the injection of a hæmangioma. For twenty-four hours the patient gave evidence of feeling sick, and usually registered a temperature of 100° or 101° with a pulse from 100 to 110. When the reaction had passed off, which was generally after the third day, the feeling of euphoria returned. The increase in the size of the tumour after the injection, although considerable, bore a minor ratio to the increase seen in hæmangiomata after injection. Inflammatory processes seemed active and prolonged, the skin giving evidence of the severity by a marked reddish discoloration. Retrogression seemed very slow. It required from four to six

months to show that the tumour had decreased in size. In the case of a baby with the left foot about four times its normal size, it required two years for the foot to attain the size to be fitted with a shoe. Subsequent injections are almost impossible to be given, if the initial injection has been a thorough one. The tumour mass is so hard that no hot water can be forced into it. All of the eight patients injected with boiling water have been benefited, but in none has the tumour entirely disappeared.

REFERENCES.—¹*Brit. Jour. Surg.* 1920, Jan., 335; ²*Jour. Amer. Med. Assoc.* 1920, Jan. 17, 201.

HÆMOPHILIA.

Herbert French, M.D., F.R.C.P.

P. E. Weil¹ speaks with the greatest enthusiasm of the value of **Blood Serum** in the treatment, not only of the hæmophilic state itself, but also of the local results of it—spontaneous hæmatomata, persistent bleedings from wounds or scratches, the gums, and so forth. His reports upon the subject sound almost too good to be true, and one is indeed struck by the relatively large number of cases of hæmophilia that he appears to have met with; a number which makes one feel that either hæmophilia is commoner in France than it is in England, or else that he includes under the heading of hæmophilia people with hæmorrhagic tendencies other than those of the definite hæmophilia as it is generally understood in Britain. He states with authority, however, that serum treatment transforms the therapeutics of hæmophilia and renders it no longer a *noli-me-tangere*. He employs the serum either for external or internal hæmorrhage, or for the preventive treatment in dealing with hæmophilias.

As regards external hæmorrhage, a piece of gauze soaked in blood serum, which may be ordinary horse serum or antidiphtheria serum, hemostyl, etc., has to be placed in contact with the wound; in some cases he has used serum that has been desiccated *in vacuo* at 0° C. If clots have developed between the bleeding point and the serum-soaked gauze, these have to be removed, for it is important, Weil states, that there should be direct contact between the serum and the bleeding points. After tooth extraction, the socket needs cleansing out with plenty of normal saline first, and then plugging with gauze soaked in serum; if there has been bleeding beneath the skin or mucous membrane, so that besides external oozing there is a subcutaneous or sub-mucous hæmatoma, he advocates the opening up of the hæmatoma, the washing of it out, and then the application of the serum dressing direct; and he records that by this means cessation of the hæmorrhage can be brought about in a few minutes. The explanation given is that the serum thus applied provides the hæmophilic blood with the ferment it lacks, namely thrombokinase.

For internal bleeding, he gives the serum either subcutaneously or, if human serum is employed, intravenously; he uses 20 to 30 c.c., generally finding, he states, that a single dose is enough to arrest the hæmorrhage, and successive doses are rarely required. If the serum is taken by the mouth it does not bring about the same result, except, he says, in gastric bleeding, when oral administration is helpful. He advocates the same doses for children as for adults.

Apart from the treatment of an actual internal or external hæmorrhage in a hæmophilic subject, he uses animal serum subcutaneously in doses of from 20 to 30 c.c. as a means of preventing hæmorrhage in connection with any surgical operation that may be required in a hæmophilic case, giving the injection preferably not more than one day before the operation takes place. He states that although operations in hæmophilic patients are naturally to be

avoided if possible, it is sometimes necessary to do them for such things as the extraction of very bad teeth, the opening of abscesses, or dealing surgically with acute appendicitis; and he states that in practice he has never had accidents with such patients in whom the serum injection had been given previous to the operation; though after the operation itself he advocates that the wounds should be plugged with gauze steeped in animal serum, or a serum dressing applied.

For the general treatment of the hæmophilic tendency, successive injections may be wanted, for apparently the benefit of one injection passes off in about six weeks to two months; and he advocates the repetition of the serum at two-monthly intervals, using 20 c.c. at each dose, even though there should be some serum rash or other anaphylactic phenomena in consequence.

As time goes on he has found that the hæmophilic tendency diminishes as the result of the serum injections, to such an extent that after some years the serum treatment can be interrupted; and amongst over fifty patients that he refers to, Weil quotes one in particular in which a man who had had six years of the continuous serum treatment then went through five years of the war without any severe bleeding catastrophe.

REFERENCE.—¹*Lancet*, 1920, ii, 300.

HÆMORRHAGE. Serum Therapy advocated (*p.* 20).

HÆMORRHOIDS, INTERNAL.

J. P. Lockhart-Mummery, F.R.C.S.

As regards the choice of operation for internal piles, it may be said that for the last twenty years three main methods have held the field—namely, the ligature operation, the clamp and cautery, and Whitehead's operation. There has been in the past much argument with regard to the merits and demerits of these various methods, more particularly with regard to Whitehead's operation. The result of increased experience has, however, settled the question, and during the last ten years Whitehead's operation has been becoming less and less popular, and now the majority of surgeons only perform it in exceptional cases. In an interesting paper by Louis J. Hirschman,¹ a well-known specialist on proctology in the United States, it is noteworthy that he agrees with the views of the specialists on this side of the Atlantic in considering the ligature operation as the best in most cases; also that stretching the sphincter is no longer necessary as a preliminary; and in disagreeing with the use of any kind of packing in the rectum after operation. He agrees that the patient's bowels should be opened on the third day. The only point in which he differs materially from English specialists is in believing it to be safe to allow the patient out of bed on the third or fourth day after operation. Most of our authorities prefer keeping the patient in bed until the ligatures have separated.

In a paper by W. B. Gabriel,² an interesting analysis is given of 500 cases of pile operations at St. Mark's Hospital, particularly in respect of hæmorrhage following operation. He found that severe secondary hæmorrhage following an operation for piles by ligature occurred in 1 per cent of the cases—namely, 5 cases in 470. The average date of the hæmorrhage was seven days after operation, and it generally followed an action of the bowels. He found that the most satisfactory method of stopping the hæmorrhage was by plugging the rectum with a vulcanite or rubber tube.

REFERENCES.—¹*N. Y. Med. Jour.* 1920, June 12, 1017; ²*Lancet*, 1920, July 17.

HAY FEVER. (*See* **ASTHMA**.)

HEAD, NEURALGIA OF. (*See* NEURALGIA.)HEAD, SURGERY OF. (*See* CRANIAL SURGERY.)

HEARING, MECHANISM OF.

John S. Fraser, M.B., F.R.C.S.

In a paper dealing with the mechanism of hearing, Rejto¹ concludes that: (1) The end-organ of the cochlea has only one stimulus—the wave-like motion induced in the labyrinth fluid. (2) In case of air conduction, both low and high tones alike are conveyed by the conducting apparatus. The difference is only that for the former the transforming action of the drum and ossicles is necessary, whereas for the higher tones it is quite enough if the two windows function normally. (3) In case of bone conduction, there must also arise the same wave-like perilymph motion. This motion directed towards the round window arises in the labyrinth fluid through the molecular vibration of the skull bones, but at the same time there is produced another motion directed towards the oval window. As only the first of these motions is necessary for perception, in case of bone conduction only the functioning of the round window is required. (4) If neither of the windows is elastic, no wave-like motion can arise in the fluid; there is neither stimulus nor perception.

*Callahan's Law of the Hearing Centres.*²—A vibrating tuning-fork placed upon the vertex is heard much more distinctly in that ear the external meatus of which is closed with the finger. The theories advanced for this phenomenon are: (1) Increased resonance of the external auditory canal; (2) Reflection of the sound waves through the cranial bones to the air in the external auditory canal, and thence to membrane and ossicles; (3) Altered tension of the membrane and ossicles. Against the last two theories we have the fact that the same condition exists when the ossicles and membrane are absent.

Callahan does not accept (1). He claims that the reason the sound is lateralized is because it follows his law of the hearing centres: When two sounds which have similar properties, except intensity, are transmitted one to each ear, both impulses will pass to the hearing centre on that side where the intensity is the greater; and there will be a summation of the two stimuli. When a tuning-fork is in contact with the teeth or forehead, and one ear is obstructed, we hear the sound louder in that ear because extraneous sounds are cut off on that side. Sounds from the tuning-fork pass to each cochlea, and then to the hearing centre on the side where the intensity is the greater. Part of the increase in intensity is due to a summation of the two sounds superimposed in that hearing centre. "*There is no such thing as increased bone conduction.*" Instead of obstructing the external auditory meatus of one ear, Callahan increased the outside sounds going to that ear so that that ear would not hear the vibrating fork placed against the teeth as loud as the ear that was free from the outside sound. Callahan found that the sound of the tuning-fork was lateralized to the ear that was receiving little or none of the extra sound. If we place a watch against the teeth and the C 256 fork a few inches from one ear, the tick of the watch is heard louder in the other ear. If we then obstruct the external meatus of the other ear, the intensity is again increased. If we obstruct the external meatus with a muffled buzzer and place a C 256 fork against the teeth, the fork is heard in the ear not occupied by the noise apparatus. If we then stop the noise apparatus but keep the meatus obstructed with it, the sound is clearly noted to pass over to the obstructed side. This shows that plugging the meatus aids in lateralizing the sound only by cutting off outside sounds.

REFERENCES.—¹*Laryngoscope*, 1920, xxx, 407; ²*Ibid.* 1910, Sept., 522.

HEART DISEASE. (*See also* ANEURYSM, AORTIC; ARTERIAL TENSION, HIGH; ENDOCARDITIS, SUBACUTE BACTERIAL; HEART, IRRITABLE; SCARLET FEVER; SYPHILIS, CARDIOVASCULAR.) *Carey Coombs, M.D., F.R.C.P.*

The study of cardiac disease is still mainly directed to an examination of the changes in function that mark its progress. Alterations of structure, as perceived by skiagraphy, have also attracted a certain number of workers. In these directions two books that have appeared of late call for particular notice. Dr. Thomas Lewis has brought out a new edition, so much revised and remodelled as to constitute a new book, of his work on *The Mechanism and Graphic Registration of the Heart-beat*.¹ This book is a mine of information as to perversions of myocardial function and their examination by the electrocardiographic method. The second book is one by MM. Vaquez and Bordet, *Le Cœur et L'Aorte; Étude de Radiologie Clinique*,² a third edition, also full of new matter.

But the diagnosis of a case of disease is not complete until we have a thorough understanding, not only of the changes in structure and function that characterize the disease, but also of those harmful influences that have initiated the changes; and because organic disease of the viscera is nearly always incurable, yet possibly preventable if its causes are known, it is a thing to be glad of that some workers, particularly in America, are realizing the need for gaining a better knowledge of the causation of cardiac disease.

What follows is, therefore, mainly a digest of articles bearing chiefly on these three kinds of study of cardiac disease—electrocardiographic, skiagraphic, and etiological. This last will be considered under the heading of prevention; the others under that of diagnosis; though we must realize that the chief value of these methods lies not so much in the added light they throw on individual cases, but in the new knowledge of cardiac disease in general which they are giving to us.

DIAGNOSIS.—Electrocardiography.—The graphic methods of studying heart disease sprang into favour because of the means offered for recognizing the several modes of cardiac failure. First among these to be so recognized came interferences with the conduction of the stimulus through the walls of the heart, and particularly with its conduction from auricle to ventricle (auriculo-ventricular block). These were studied with the more zest because they afforded a definite example of a focal lesion of the myocardium disturbing its efficient work. And it is this view that gives significance to the fact established by Parkinson, Gunson, and Gosse³; to wit, that in 50 cases of acute rheumatism some degree of auriculoventricular block was found in 15 instances. In most it amounted to no more than a delay in the speed of conduction from auricle to ventricle. In a few the systole of the ventricle failed occasionally to follow that of the auricle, because the transmission of the stimulus through the *a-v* bundle was occasionally blocked. Even in these, the block only lasted a few days—an interesting observation, throwing valuable light on the life-history of the acute inflammatory foci of rheumatic carditis.

With sino-atrial block, examples of which are recorded by Brown⁴ and White,⁵ the case is different. The causation of auriculoventricular block by a focal lesion of the heart is easy to conceive, and indeed many cases are now on record where such a lesion has been seen to divide the narrow strip or bundle of muscle which alone connects auricle and ventricle. Such a case is recorded by Bridgman and Schmeisser,⁶ who found this *a-v* bundle severed by a gumma in a patient who during life had suffered from heart-block. But sino-atrial block—i.e., stoppage of the transmission of the stimulus from its point of origin at the sino-atrial node in the wall of the superior vena cava to the auricular wall—is less clearly understood. Possibly it is not very uncommon as a transitory phenomenon, particularly in hearts under the influence of digitalis.

But it would be difficult to conceive of any focal lesions of the myocardium causing it. The sino-atrial node is a narrow structure 1 to 2 cm. in length, connected on all sides with the auricular muscle, and a local lesion, therefore, could scarcely separate the two. Consequently it is not surprising to find, in both the cases noted, that the block is probably referable to excessive vagus influence on the transmission of impulses from the sinu-auricular node to the auricular walls.

Even more important to clinical medicine has been the service rendered by the graphic methods in establishing the relation between total arrhythmia and auricular fibrillation. This is a very common kind of cardiac breakdown. Its existence is compatible with life over a period of years, but it is an invalid life. Occasionally, as Mason⁷ shows, this form of arrhythmia occurs in transitory paroxysms; but even so it usually settles down after a while to a permanent career ending only with the patient's death. The mechanism by which the orderly sequence of the normal auricular systole is replaced by this disorderly tremor of the auricular walls has been a subject of much speculation. In an appendix to his new book, Lewis¹ says that his recent studies "lead up to the conclusion that auricular fibrillation is not due to the activity of many centres, but results from depressed conduction, whereby the excitation wave is broken up and travels along sinuous and varying paths, re-entering fibres through which it has already travelled". In articles published since,⁸ the same writer, with Feil and Stroud, gives some account of the researches leading him to adopt their view of auricular fibrillation. These articles are so technical that it is difficult to abridge them here, but this much may be said: the fundamental conception is that auricular flutter (the type of regular auricular tachycardia that often precedes the irregular tachycardia of fibrillation) is a 'circus movement'—i.e., owing to some obstruction to the outflow of the stimulus from the sinu-auricular node into the auricular walls, that stimulus is switched into a circular path round and round the auriculo-caval junctions. Centrifugal branches are thrown off from this 'circus movement' into the remainder of the auricular wall. When these, again, are so obstructed and deflected by the degenerate condition of the auricular myocardium as to interfere with and submerge the original 'circus movement', flutter is replaced by fibrillation.

The great interest of this hypothesis lies in this, that auricular failure is by it attributed to changes diffused through the auricular wall and not limited to the sinu-auricular node; and that it is an upset of conductivity, and not of contractility. This is of some interest in relation to certain electrocardiographic phenomena of ventricular failure about which there is much discussion in America. And, after all, it is ventricular failure that counts for most. Auricular systole and auriculoventricular conduction are but accessory parts of a mechanism which achieves its main task in an efficient ventricular systole. An interesting experimental study by Eyster and Swarthout⁹ shows that auricular flutter and fibrillation reduce to a varying degree the volume thrown out of the ventricles at each systole, fibrillation being more potent than flutter; while partial and complete auriculoventricular block reduce the systolic output of the ventricles very considerably. But these latter are relatively rare forms of cardiac disease, while primary ventricular failure is common. Anything that can throw light on ventricular failure is therefore to be welcomed.

In order to make the claims of the American workers intelligible to the general reader, one must recall the essential facts of electrocardiography. The electrocardiogram is a graphic presentation of the changes in electrical potential in the wall of the heart which accompany its movements. This record (*Fig. 35*) is usually divided into five phases, P, Q, R, S, T. P, R, and T are larger than Q and S; they point upwards in the tracing, while Q and S point downwards.

P is synchronous with auricular systole, Q R S with the main ventricular systole, and T with the last phase of ventricular systole. The alternations described by Willius,¹⁰ Pardee,¹¹ Meakins,¹² Robinson,¹³ Smith,¹⁴ and Wilson and Hermann¹⁵ are: (1) Lengthening of Q R S; (2) Lengthening of S T; (3) Notching of R, usually a smooth sharp peak; and (4) Downward pointing of T. There is little doubt as to the association of these changes with impaired ventricular efficiency. Willius was able to connect them, in a large series of cases, with a high cardiac mortality, and Pardee and Meakins associated them, or some of them, with cardiac pain—in Pardee's cases, of the severe type springing from gross coronary obstruction. But there is a difference of opinion as to the precise mode by which ventricular disease causes these electrocardiographic abnormalities. Willius believes they are due to interferences with the conduction of the stimulus through the ventricular walls, but Smith and Wilson

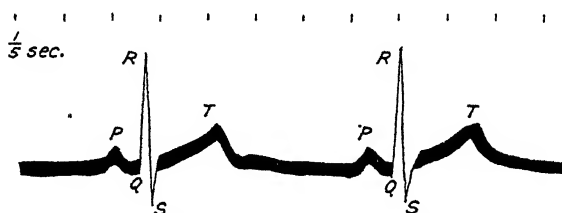


Fig. 35.—Electrocardiogram.

and Hermann bring experimental evidence to rebut this proposition, and Robinson thinks that the transitory career of the electrocardiographic changes in some cases points to their origin in disturbance of myocardial metabolism rather than of structure. It is, at all events, clear that further observations are necessary before these phenomena can be satisfactorily explained. As to one of them, the downward turn of the T wave, it is interesting to note that Smith¹⁶ found it in dogs after the left coronary artery had been tied, but not after the right; also after artificial cooling of the ventricular apex. He concludes that the T wave is reversed in these experiments because they delay or prolong the contractions at the apex of the ventricle in such a manner that their occurrence overlaps that of the basal contractions; these latter normally moving the electrocardiographic record upwards in the T period if they have that period all to themselves. [Other workers had already shown, by the way, that a similar reversal of the T wave can be produced by vagus stimulation.—C. C.] Hamburger¹⁷ describes a series of eighteen cases in which the P (auriculosystolic) wave of the electrocardiogram was inverted, ascribing this in some cases to actual changes in the cardiac muscle, in others to variations in vagus control. Kleemann¹⁸ and Laslett¹⁹ have recorded systematic observations of the effect on the human heart-beat of compression of the right and the left vagus respectively. Both writers' conclusions are much the same. Stimulation of the vagus tends (a) to slow down the production of stimuli at the sinu-auricular node, (b) to retard the transmission of stimuli from auricle to ventricle. There is a little difference between the two vagi: the (a) effect is about 25 per cent more often produced by stimulation of the right vagus; the (b) slightly more often by that of the left.

Skiagraphy.—If the ordinary man, after reading the above résumé of recent electrocardiographic work, is tempted to ask how much practical value is gained by so much labour, much more will he ask the same question in respect of the cardiac skiagraphy studied with such enthusiasm by Vaquez and Bordet.²

Most of their book is devoted to a statement of the quantitative variations of the normal cardiac shadow rather than to a consideration of abnormal shadows. And in this they have many followers, as for example Canovas²⁰ and Martinet,²¹ who give much time and ingenuity to the construction of formulæ to determine the normal relation of the size of the cardiac shadows to that of the body as a whole. How controversial the whole matter is may be gauged by the fact that, whereas Laubry and Bordet²² think that the skiagraphic shadow of the irritable heart is wider than normal, the careful and systematic American studies of Bernard Smith²³ prove that, as English workers had already shown, it is on an average smaller than normal. The American workers had indeed opportunities of leisurely study of this problem of cardiac skiagraphy in its various aspects that they used to full advantage. We may, therefore, accept with some confidence the opinion of Cohn²⁴ that the use of the transverse diameter of the cardiac shadow is a satisfactory measurement, and that measurements outside this are unnecessary. Even this is only of relative value in his judgement, because the variations within the normal are so great that it is impossible to speak in absolute terms of a 'wide' or a 'narrow' heart. In actual practice, therefore, it will seldom be necessary to use skiagraphy in the diagnosis of cardiac disease except for the discovery of lesions which, like aneurysm or pericardial effusion, cast an abnormal shadow; and occasionally to see whether the right heart is enlarged or not.

A new path of thought in regard to cardiac skiagraphy is opened up by Assmann,²⁵ who states that the shadow of the roots of the lungs is much larger than normal in cases of such cardiac lesions as produce stasis in the pulmonary circulation, particularly therefore in mitral lesions and some forms of congenital malformation. The increased shadow is cast by the distended vessels.

For further reference to the radiography of the heart, see p. 30.

Murmurs.—War experiences have driven home the warnings uttered by Sir James Mackenzie as to the need for discrimination between the various kinds of murmur. Conner,²⁶ for instance, as a result of examinations of recruits in America, concludes that fully nine-tenths of all apical systolic murmurs belong to the class of accidental or functional murmurs. This estimate is probably true if it applies only to young adults. Inclusion of children and old people would increase the percentage of organic bruits. But it is not only the ignoring of certain murmurs that we have learnt to practise. There are others that always spell organic disease; particularly the presystolic murmur of mitral stenosis and the diastolic murmur of aortic regurgitation. Pardee²⁷ has made a careful study of the various means by which these bruits may best be heard. He finds that the crescendo presystolic murmur of mitral stenosis is best heard after exercise, with the patient lying down and on his left side; while the diastolic murmur of aortic incompetence is best heard after exercise, with the patient standing up and bending forward. In relation to this latter murmur, Gordon²⁸ gives a useful hint, to the effect that it is heard better with a wooden than with a binaural stethoscope; and sometimes better when the observer applies his ear directly to the patient's chest, without the mediation of any stethoscope at all.

TREATMENT.—As usual, much care and thought are devoted to the subject of **Digitalis**. One reason for this is that before the war America used to get digitalis from Germany. Now she has to grow her own. Fortunately, as an exhaustive research by Pratt and Robinson²⁹ shows, "the best American digitalis, both wild and cultivated, is equal in activity to the best European digitalis". They recommend that all digitalis be tested biologically before it is gathered in large quantities for therapeutic use.

Another reason for renewed scrutiny of this drug is that increase in its use,

and in our understanding of the results that should follow, has brought to light the variability of its action. This is partly due to the varying strength of different preparations, one reason for which is brought out by Zueblin.³⁰ His interesting researches prove that preparations of digitalis, as well as strophanthus and other drugs, gradually diminish in radio-activity under conditions of storage. He does not discuss at length the processes that lead to these alterations, but is content to show that actual physical alterations do occur, and to suggest that these are almost certain to be accompanied by a pharmacodynamic deterioration. Cumston's paper,³¹ describing recent French work, shows that the reason why these physical changes occur in stored drugs is probably to be found in the persistent activity, after storage, of endocellular diastases which work upon the glucosides of digitalis and reduce its powers. On the strength of this theory a 'physiological extract' of the drug has been prepared from 'sterilized' foxglove plants, i.e. plants in which the endocellular oxidases have been killed. It is possible that along these lines a durable digitalis extract may be arrived at.

But another source of variability in the action of digitalis is to be found in the difference between various preparations in the rate of their absorption from the alimentary tract (Pardee³²). As Hatcher³³ remarks, this difficulty would not be a serious one if it were always possible for each of us to use consistently his own preparation of digitalis, but unhappily this cannot always be realized. Hatcher has accordingly prepared a chloroform-soluble substance from digitalis which exerts its cardiac action. It is soluble in alcohol, and this solution is miscible with water. Eggleston³⁴ has used it for the treatment of cardiac disease, and finds it equal to the best alcoholic tinctures and better than the second-rate tinctures.

West and Pratt³⁵ describe an aqueous extract of digitalis, made at Harvard, designed to give the profession not only a stable preparation, but also a dosage with some direct relation to physiological activity. This latter becomes the more necessary because of the new method of giving digitalis in heart disease, which has been introduced in America. This plan is well described in the paper by West and Pratt, also by Pardee³⁶ and by Robinson.³⁷ It is founded on researches by Eggleston, and depends on the fact that the amount of digitalis required to produce its physiological effect is proportional to the body-weight. This rule is, however, conditioned by certain individual idiosyncrasies which it is impossible to foresee, and which therefore forbid us to do what would otherwise be the rational plan, to give to each patient a single dose of digitalis equivalent to the calculated physiological dose—i.e. the dose which will in a person of known weight cause early toxic symptoms. According to Pardee, this may be worked out at 2 min. to each pound of body-weight, so that a patient weighing 10 stone would just tolerate a dose of 4 to 5 drachms of the tincture. But as we must allow for the varying response of the individual to the drug, it is best, according to Pardee, to lead off with a dose amounting to one-half of this physiological maximum: to let this suffice for the first day of treatment; and on subsequent days to complete the dose in four-hourly instalments, the size of which will vary according to the patient's reaction to the large initial dose. Robinson gave single large doses of standardized tincture of digitalis to twenty-six patients with auricular fibrillation or flutter. He found an effect in from two to five hours after administration; the effect was maximal in about twenty-four hours, and it continued for an average of ten days. Probably the conditions under which the effects of the drug have to be watched in most cases of illness would preclude the use of the single large dose, but an approach to it, such as Pardee suggests, ought to be practicable. One of the advantages claimed by Kerlerburg³⁸ in the intravenous injection of

Strophanthin in cardiac failure is that it can be done by the medical man visiting the patient's home, without skilled help. But this is even truer of the massive oral dose of digitalis, which will, it is hoped, make the intravenous method almost wholly unnecessary.

Papers by Pezzi and Clerc³⁹ and by Schrumpf⁴⁰ draw attention to the usefulness of **Quinine** in auricular fibrillation and flutter, either alone or with digitalis. Ordinary doses are sufficient.

Capacity for Work.—One of the most important questions that has to be settled in the treatment of a patient with cardiac disease is the amount of work of which he is capable. As Moon⁴¹ points out, 'compensated' cases of post-rheumatic heart disease are capable of more work than similar cases of cardiac syphilis or cardiosclerosis, because the former is a stationary lesion, or at all events a less progressive lesion than the two latter. In his paper various occupations are considered, and the general conclusion is that no one kind of work can be recommended indiscriminately to cardiac patients, but that each case must be gone into carefully and in detail. Cotton⁴² shows that aortic regurgitation is compatible with good exercise tolerance (the cases of which he is writing being rheumatic and not syphilitic), and⁴³ also that in cases of early mitral stenosis the exercise tolerance is good. Naturally, in both these types of post-rheumatic heart disease the tendency is to a slow downward progress, so that the years of activity are in general shorter by several decades than those of the average healthy man. Yet Gordon⁴⁴ describes the case of a woman who, acquiring aortic and mitral disease of rheumatic type at 22, led an active and useful life till she died at 52. In quite another kind of organic heart-disease, heart-block, Goodall⁴⁵ found that 8 of his 20 patients were able to carry on light work with periodical rests.

Obviously there is need for systematic study of the capacity for work in chronic heart disease. In America, and notably in New York⁴⁶ and Chicago,⁴⁷ heart clinics have been established wherein the patient's capacity for work is tested. After this a suitable situation is, if possible, found for him. The value of such an organization is beyond dispute. The patient is all the better for the work, and so is the State, which gets a certain production from the man in exchange for supporting him. The only approach to work of this kind in this country is to be found in the cardiac clinics of the Ministry of Pensions—pioneer work which may make a way for greater things.

PREVENTION.—But it is not only in the work of 'making the best of a bad job' that the American cardiac clinics are giving Britain a lead. Here also the rheumatic child is being cared for, albeit not perhaps as fully as one would wish. The immense importance of doing something to arrest the progress of this dire calamity, rheumatic heart disease, is brought out by several papers. Russell Wells and others,⁴⁸ from a statistical survey of data compiled from examinations of recruits, conclude that "the most important etiological factor in the production of organic lesions of the heart valves in men between the ages of 18 and 41 is rheumatic fever". Viewing the matter from another angle, Poynton, Paterson, and Spence⁴⁹ examined the figures relating to cases of rheumatism in children under 12 admitted to the Hospital for Sick Children, Great Ormond Street, between July, 1919, and June, 1920. Of 174 such children, 114 had definite morbus cordis; 13 per cent died; and of those examined only three months after the end of the twelve months named, 30 per cent had permanent cardiac disease. They remark upon the loss of useful citizens thus caused by a disease which cripples its victims before they have even begun their life's work, and also upon the heavy cost of their hospital treatment. Something would be gained if arrangements were made by which these children could remain in country hospitals for long periods, and be

educated meanwhile. As it is, the rheumatic child is so often ill that his education is greatly handicapped, and he arrives at adult life (if, indeed, he survive so long) with no training of mind to raise him above the general labour market—mentally unfitted for sedentary work, and physically unfitted for manual labour. There is no reason why he should not be educated and treated simultaneously, in the manner that is already being practised on behalf of children suffering from surgical tuberculosis. Indeed, it is probable that the same institution that serves for the latter disease might also be used for children with cardiac rheumatism.

But even more would be gained if, as the outcome of studies of the causes of rheumatic heart disease, a campaign of prevention could be initiated. The writer⁵⁰ has published a brief account of researches into the climatic and geographical factors predisposing to deaths from rheumatic heart disease in Bristol during the years 1876 to 1913. The only positive facts that came to light were, first, the influence (already established by Newsholme's researches) of periods of low rainfall in predisposing to rheumatic infection; and, second, the probable influence of 'urbanization' in the same direction. This latter point needs further investigation. It is one of no small importance, as, if corroborated, it would furnish one more powerful argument in favour of town planning. It is possible, also, that other predisposing factors might be unearthed by further research, and it is therefore gratifying that a leading article in the *Lancet*⁵¹ should demand such investigation on a wide basis.

REFERENCES.—¹Published by Shaw & Sons, London, 1920; ²Published by J.-B. Baillière, Paris, 1920; ³*Quart. Jour. Med.* 1920, July, 363; ⁴*Arch. of Internal Med.* 1919, ii, 458; ⁵*Ibid.* 1920, i, 420; ⁶*Johns Hop. Hosp. Rep.* 1919, 90; ⁷*Johns Hop. Hosp. Bull.* 1920, 145; ⁸*Heart*, 1920, vii, 191, 247, and 293; ⁹*Arch. of Internal Med.* 1920, i, 317; ¹⁰*Ibid.* 550; ¹¹*Ibid.* ii, 244; ¹²*Ibid.* 1919, ii, 489; ¹³*Ibid.* 422; ¹⁴*Ibid.* 1920, ii, 205; ¹⁵*Ibid.* 153; ¹⁶*Ibid.* 673; ¹⁷*Ibid.* 232; ¹⁸*Deut. Arch. f. klin. Med.* 1919, Sept., 221; ¹⁹*Heart*, 1920, iv, 347; ²⁰*Rev. Espan. de Med. y Cir.* 1919, 600; ²¹*Presse méd.* 1920, 302; ²²*Ibid.* 1919, 633; ²³*Arch. of Internal Med.* 1920, i, 532; ²⁴*Ibid.* 499; ²⁵*Deut. Arch. f. klin. Med.* 1920, 335; ²⁶*Amer. Jour. Med. Sci.* 1919, ii, 773; ²⁷*Ibid.* 319; ²⁸*Practitioner*, 1920, ii, 136; ²⁹*Jour. Amer. Med. Assoc.* 1919, ii, 1606; ³⁰*Med. Record*, 1920, i, 16; ³¹*N. Y. Med. Jour.* 1920, i, 384; ³²*Jour. Amer. Med. Assoc.* 1919, ii, 1822; ³³*Ibid.* 1920, ii, 460; ³⁴*Ibid.* 463; ³⁵*Ibid.* 77; ³⁶*N. Y. Med. Jour.* 1919, ii, 1064; ³⁷*Amer. Jour. Med. Sci.* 1920, i, 121; ³⁸*Munch. med. Woch.* 1920, 152; ³⁹*Presse méd.* 1920, 334; ⁴⁰*Ibid.* 524; ⁴¹*Brit. Med. Jour.* 1920, i, 628; ⁴²*Lancet*, 1919, ii, 470; ⁴³*Brit. Med. Jour.* 1919, ii, 840; ⁴⁴*Lancet*, 1920, i, 811; ⁴⁵*Ibid.* 909; ⁴⁶*Jour. Amer. Med. Assoc.* 1920, i, 1564 and ii, 609; ⁴⁷*Ibid.* 1919, ii, 1792; ⁴⁸*Brit. Med. Jour.* 1920, i, 730; ⁴⁹*Lancet*, 1920, ii, 1086; ⁵⁰*Ibid.* 226; ⁵¹*Ibid.* 1103.

HEART, IRRITABLE.

Carey Coombs, M.D., F.R.C.P.

We are still reading reports by various writers on different aspects of this disorder. These are the outcome of a more leisurely and balanced consideration of the problem than was possible during the progress of the war. As the conclusions thus arrived at have an applicability to similar disorders seen in civil practice with unusual frequency in these days of stress, it seems worth while to attempt a summary of them.

ETIOLOGY.—The whole interest of the matter turns on the causation of the syndrome. If this can be understood, a rational plan of treatment can be laid down, and, better still, means of prevention can be considered. One thing has been generally agreed upon, and that is that under similar circumstances different individuals show a widely dissimilar liability to development of 'irritable heart' symptoms. Thus Krogh, Ritchie, and White¹ distinguish a group of men with an immature or untrained heart—young soldiers often of sedentary pursuits in civil life. MacMahon² attributes the ease with which fatigue was induced in irritable heart patients, partly at all events, to lack of development of the skeletal muscular system. Cohn,³ in a masterly survey

of the whole subject, lays great stress on the high susceptibility of the constitutionally timorous. As he says, it is not the only factor, but it is a very weighty one. It may be agreed, then, that the inherent predisposition to the irritable heart or effort syndrome is partly physical, partly psychical.

When we turn to a consideration of the acquired factors, we find a similar division into two parts. Some writers insist particularly on the importance of microbic infection as a provocative agent (Wilson,⁴ Krogh, Ritchie, and White,¹ Barlow³). Venning⁶ gives first place to the mental and physical stress of war, and puts infective disease in a second place. Culpin⁷ goes further, and states that "the majority of cases found among pensioners and diagnosed 'D.A.H.' are entirely of psychogenetic origin". A discussion in which Coombs, Herapath, Morris, and Birrell⁸ took part showed that among civil patients, as well as among serving soldiers and pensioners, both factors were of importance; that even where symptoms dated from the onset of an infection, an 'anxiety state' formed the background essential to the establishment of the syndrome.

PATHOLOGY.—Granted, then, that we have in this disorder the product of a combination of factors, some inherent and some acquired, partly psychical and partly physical, by what means does it so arise?

The idea that prevailed at the outset of the war was that injury to the myocardium was responsible. This view has of course been long abandoned, and it is generally agreed that some part of the nervous system bears the brunt of the disorder. Wilson¹ brings evidence in support of his contention that the vagus of these patients is over-excitable. Musser⁹ shows that their gastric juice is liable to be hyperacid, a point in favour of the over-excitable vagus theory. But it seems unlikely that all those causal agents alluded to above, inherent as well as acquired, should concentrate their influence solely upon the patient's vagus. The intolerance to accumulating CO₂, which Drury¹⁰ thinks is in measure the cause of dyspnoea in irritable heart, is presumably evidence of bulbar over-sensitiveness. Others would say, as R. G. Gordon did in the discussion⁵ alluded to above, that the action of fatigue, bacterial toxins, etc., on the highest cortical levels, lowered the mental resistance against injurious impressions. Probably most would now agree with Mackenzie,¹¹ who says that the irritable heart syndrome is but one aspect of a general exhaustion, mental and physical, which is the inevitable result of exposing ordinary men to extraordinary hardships.

TREATMENT.—Extended experience confirms the view expressed in last year's ANNUAL that the only method of cure is to search carefully in each individual case for the causal factors, and treat these, whether they be mental or physical, by getting rid of them. Often the cure is begun when the patient can be persuaded that his symptoms are due, not to the heart disease he has feared, but to a nervous disorder that he can help to get rid of. Herapath⁸ finds that systematic **Physical Exercises**, carried out by the patient in his own home, are of value both directly and as a medium of optimistic suggestion. In this connection it is of interest to read Cohn's³ eulogy of the convalescent camp treatment of 'D.A.H.' in the British Army in France, in which he lays particular stress on the importance of a wholesome and bracing moral atmosphere; and the account given by Krogh, Ritchie, and White¹ of the *musical* drill, organized at an Egyptian base [a measure the success of which has been described to the reviewer by an eye-witness, Dr. J. Ewing, D.C.M.S., Cornwall Area, Ministry of Pensions.—C. C.].

PREVENTION.—As Bernard Smith¹² writes, it is impossible to train up men of poor physique into efficient soldiers in the brief period allowed by modern war. This is a civil problem demanding attention during peace. At the same time it must be remembered that it is not only a matter of defective physique

but also of feeble morale, for which the materialistic philosophy of our times is largely responsible; and this will hardly be corrected even by universal military training.

REFERENCES.—¹*Lancet*, 1920, i, 853; ²*Amer. Jour. Med. Sci.* 1919, ii, 818; ³*Ibid.* 453; ⁴*Lancet*, 1920, i, 146; ⁵*Ibid.* 593; ⁶*Brit. Med. Jour.* 1919, ii, 337; ⁷*Lancet*, 1920, ii, 184; ⁸*Bristol Med.-Chir. Jour.* 1920, 108; ⁹*Amer. Jour. Med. Sci.* 1920, i, 664; ¹⁰*Heart*, 1920, vii, 165; ¹¹*Brit. Med. Jour.* 1920, i, 491 and 530; ¹²*Arch. of Internal Med.* 1919, Sept., 321.

HERNIA, FEMORAL.

E. Wyllys Andrews, A.M., M.D., F.A.C.S.

The inguinal route in femoral herniotomy is becoming more widely adopted each year. The operations of Lotheissen and Moschowitz are being done as a routine in many clinics. These, briefly, consist in exposing the neck of the sac through the inguinal canal, emptying and resecting it, and then sewing Cooper's ligament to the pubic bone. The wound is then closed as in inguinal herniotomy. Northrop¹ and Eisendrath² have described this technique in detail. The advantages are several. Exposure is better, and there is less danger of injuring important structures. The closure of the femoral canal is at the upper instead of the lower end, and no pouch is left to favour recurrence. Another important point is that the reduction of the hernial contents is easier. Cates³ reports two cases in which Poupart's ligament had to be severed in order to reduce the hernia, in operations from below.

REFERENCES.—¹*Hahnemann Month.* 1920, iv, 187; ²*Surg. Clin. Chicago*, 1920, iv, 49; ³*Amer. Jour. Surg.* xxxiv, 90.

HERNIA, INGUINAL.

E. Wyllys Andrews, A.M., M.D., F.A.C.S.

M. Masson¹ reports a series of 330 operations for recurrent inguinal hernia at the Mayo clinic. His statistics show that recurrences are much more common in older subjects. In all about 1 per cent of their herniotomies suffered recurrences, slightly less if the floor of the canal was closed and slightly more if it was not. [The reviewer heartily agrees with the principle of sewing the conjoined tendon to Poupart's ligament behind the cord and not destroying the obliquity of the inguinal canal.—E. W. A.]. The routine operation used by Masson is a slight modification of the Andrews-Bassini method. The cut-off neck of the sac is always transplanted above the internal ring so as not to press on it. Continuous chromic catgut is used to sew the internal and external oblique muscles to Poupart's ligament, both under the cord, which is covered by the lower fragment of the external oblique aponeurosis. When an undescended testicle is present, the Ferguson operation is used. When there is a deficiency of the internal oblique, the rectus is used to fill the gap, according to the technique of Halstead or Bloodgood.

The closure of the internal ring and the neck of the sac is receiving more attention. As noted above, Masson transplants the stump of the sac and also takes a stitch or two above the cord. Quain² states that if the internal ring will admit the tip of the finger, the cord should be dissected apart and a stitch put in between the vas and the vessels. La Roque³ goes farther, and spreads the fibres of the internal oblique just above the canal and opens the peritoneum (*Fig. 36*). This enables him to expose the sac from within and to suture the neck tightly. It also facilitates the dissection of the sac, as the operator can put his finger into it from within.

Schönbauer⁴ reports fourteen cases of very large herniæ, and discusses treatment. In many such herniæ the contents have been out of the abdomen so long that its walls are shrunken and will not contain them. Therefore they can only be reduced under extreme pressure, if at all. This tension on the sutures is most prejudicial to good wound healing, and in some cases is so

great as to interfere with respiration. Schönbauer advises gradual taxis for weeks if necessary in order to reduce these herniæ as much as possible before

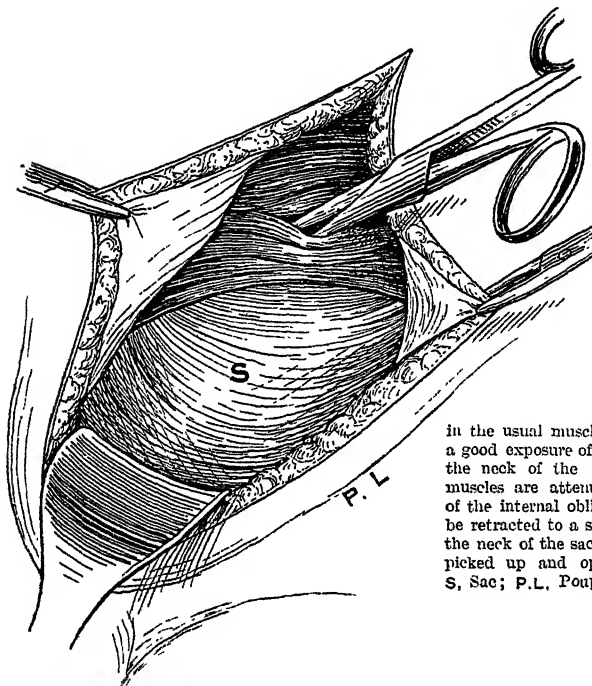


Fig. 36.—La Roque's method in inguinal hernia. The usual incision through skin, superficial fascia, and aponeurosis exposes the inguinal canal containing the hernial sac and cord. With blunt forceps or scissors inserted between the muscle bundles of the internal oblique and of the transversalis and its fascia about an inch above their lower margin, the bundles are separated

in the usual muscle-splitting fashion, making a good exposure of the peritoneum well above the neck of the sac. In cases where the muscles are attenuated, the arching portion of the internal oblique and transversalis may be retracted to a suitable position well above the neck of the sac. The peritoneum is then picked up and opened in the usual way. S, Sac; P.L., Poupart's ligament.

operation, and then at the operation, if there appears to be doubt as to the ability of the abdomen to hold the viscera, an intestinal resection is

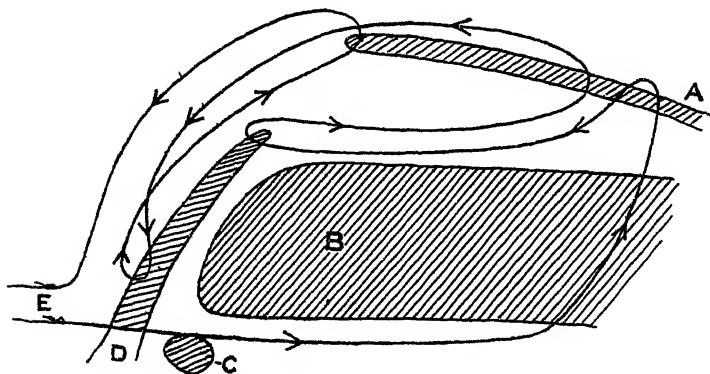


Fig. 37.—Linnartz's stitch for closing inguinal hernia. A, Aponeurosis; B, Muscular layer; C, Spermatic cord; D, Poupart's ligament; E, Knot.

indicated. As much as 3 metres can be removed, which will always allow the remainder to be reduced. Rutherford⁵ also reports the excision of 10

inches of the cæcum, which could not be pulled out of the scrotum in a sliding hernia.

Estapé⁶ has used a unique method of dealing with gangrenous strangulated hernia in two cases with good results. After exposing and opening the sac and noting its gangrenous contents, he felt that the patient could not withstand any radical procedure, so he covered the field and opened the abdomen just above, and anastomosed the afferent and efferent parts of the strangulated loops. This wound was closed and the other left open, and the sloughing allowed to proceed. This cicatrized in about four weeks. [In the opinion of the reviewer, such a procedure may be of great value. He was shocked to learn that the mortality from operations for strangulated herniæ in a number of our large hospitals averaged over 50 per cent. Therefore it is evident that a radical change in our methods of treatment is necessary. The procedure just described has many obvious disadvantages—e.g., the danger of permanent faecal fistula, sepsis, and the purulent granulating wound—but it may be a means of reducing the appalling mortality, and deserves trial.—E. W. A.].

Linnartz⁷ has published a new stitch for closing inguinal herniæ (*Fig. 37*). It is rather complicated, but when completed makes an imbrication of the aponeurosis of the external oblique, the distal fragment sliding under the proximal one. It thus takes the place of three rows of sutures, and only two or three such sutures would be needed to close the canal. It has the disadvantage, however, of leaving the cord posterior, thus destroying the obliquity of the canal.

REFERENCES.—¹*Minnesota Med. Jour.* 1919, ii, 373; ²*Surg. Gynecol. and Obst.* 1920, xxx, 88; ³*Ibid.* 1919, Nov., 507; ⁴*Wien. klin. Woch.* 1919, Nov. 6, 1093; ⁵*Glasgow Med. Jour.* 1919, Sept., 113; ⁶*Rev. Espan. de Med. y Cir.* 1919, Nov., 595; ⁷*Centralbl. f. Chir.* 1920, Sept. 8, 1165.

HERPES ZOSTER.

E. Graham Little, M.D., F.R.C.P.

Barber¹ reports a very exceptional case of herpes zoster involving simultaneously the seventh dorsal segment and the ophthalmic division of the fifth, both on the left side, in a girl, age 6 years.

See also GENICULATE GANGLION SYNDROME.

REFERENCE.—¹*Lancet*, 1919, ii, 1136.

HICCOUGH. Benzyl Benzoate in the treatment of (*p. 6*).

HODGKIN'S DISEASE. (*See LYMPHOSARCOMA AND HODGKIN'S DISEASE.*)

HOOKWORM DISEASE. (*See ANKYLOSTOMIASIS.*)

HYDATID CYSTS.

Herbert French, M.D., F.R.C.P.

New Zealand and Australia are perhaps the best known parts of the British Empire in which one commonly finds hydatid disease in man, but there are other parts of the world in which it is a relatively well-known malady. Uruguay is one of these; indeed, it is so common there that there were no fewer than 165 cases of it in the Montevideo Hospital in twelve months recently. The figures have been analyzed by Zerbino,¹ who shows that no fewer than 4.34 per cent of the children sent to hospital for various complaints were instances of hydatid disease; the corresponding figure in adults being 1.32 per cent.

The liver and lungs were the seat of the lesion in over 60 per cent and 21 per cent respectively in children; and 54 per cent and 23 per cent in adults; but a striking feature of his statistics is that no fewer than 3.82 per cent of

the children with hydatid disease had hydatid of the brain. Of the hydatid cysts in children, 19 per cent supplicated.

Zerbino's figures point to this form of parasitic infection being almost a scourge in Uruguay.

REFERENCE.—*Jour. Amer. Med. Assoc.* 1920, Jan. 17, 213.

HYPERCHLORHYDRIA IN CHILDREN. (*See CHILDREN, GASTRO-INTESTINAL DISORDERS IN.*)

HYPERTROPHIC PYLORIC STENOSIS. (*See STOMACH, SURGERY OF.*)

HYSTERICAL DEAFNESS. (*See EAR, INNER.*)

IDIOCY, AMAUROTIC FAMILY. (*See AMAUROTIC FAMILY IDIOCY.*)

IMMUNITY REACTIONS.

O. C. Gruner, M.D.

Interest has centred round the question of whether immunity may not be heightened by the use of physical agents, instead of biological as hitherto. Beginning with Murphy's finding that lymphocytes increase in cases of cancer infection, and that destruction of lymphocytes by repeated small doses of α rays led to susceptibility to cancer (in animals), it was found that a purely physical process would heighten immunity, because suitable adjustments of α -ray doses would increase the activity of the lymphoid centres. Dry heat will produce the same effect.¹ Vaughan and Palmer² also discuss whether there is not such a thing as non-specific immunity. In this case a non-proteid poison may be used to heighten immunity; although it does not prevent infection, it will serve to mitigate the virulence of an infection. This method, however, is not as efficient as the use of a vaccine. (*See PROTEIN THERAPY*, p. 18.)

Shaw-Muckenzie³ shows that lipase has something to do with immunization. This is related to the activity of the pancreas. The addition of pancreatic co-enzyme and of vaccine to serum exerts *in vitro* a lipolytic action, and the serum so treated has bactericidal properties.

Tests of Immunity Reactions.—Otani⁴ gives a new phagocytosis test which is specific. Its chief application is in the diagnosis of typhoid fever or dysentery. It serves also for the detection of tuberculous infection. The citrated blood is mixed with a specially prepared bacillary suspension. Where there is leucopenia, it is necessary to mix the blood with normal blood or with non-washed leucocytes. The test is performed as in the opsonic-index test, but the films are prepared in special ways according to the organism under consideration. Only the leucocytes are counted which have taken up organisms. The number per leucocyte does not signify. A reaction is not positive unless 30 per cent of the leucocytes have taken up organisms.

Blaivas⁵ has made a comparative study of the Wassermann test and the Heet-Weinberg-Gradwohl modification. The latter is of no use unless the serum to be tested contains natural complement. He does not rely on it as much as on the Wassermann.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1920, April 10, 1028; ²*Military Surgeon*, 1920, Jan., xlv, 1; ³*Lancet*, 1919, i, 825; ⁴*Med. Record*, 1920, Mar. 13, 439; ⁵*Jour. of Lab. and Clin. Med.* 1920, Jan., 244.

INDIGESTION IN CHILDREN. (*See CHILDREN, GASTRO-INTESTINAL DISORDERS IN; INFANT FEEDING.*)

INDUSTRIAL HEALTH. (*See also PUBLIC HEALTH ADMINISTRATION.*)*Joseph Priestley, M.D., D.P.H.*

Alcohol and Industrial Conditions.—A report by Dr. McDougall, F.R.S., and Miss May Smith, M.A., has been published during 1920 by the Medical Research Council, dealing with a series of experimental studies on the effects of alcohol during normal and fatigued conditions of workers. In the course of protracted fatigue effects following several nights' loss of sleep, alcohol acts deleteriously during the stages of increased inefficiency, whereas it acts beneficially as the subject later begins to regain his previous efficiency. At the former stage, errors are increased; at the latter, errors are reduced. The value of these experiments is to be found in the fact that discrepancies in former experiments are explained—previous experiments having, apparently, failed to allow for the stage or degree of fatigue, when the alcohol was taken for experimental purposes. Alcohol is undoubtedly on its trial, and all evidence, both for and against, must be carefully sifted before a definite conclusion can be given. The manual workers are specially concerned, though brain workers also are waiting the expert views of those best qualified to come to a decision, and not of the faddists of either one side or the other. *In medio tutissimus.*

INFANCY, INTRAVENOUS INJECTIONS IN.*Frederick Langmead, M.D., F.R.C.P.*

H. J. Van den Berg¹ makes a plea for the adoption of the superior longitudinal sinus as the usual route. He thus summarizes the conclusions drawn from his own experience :—

1. The obtaining of blood for diagnostic purposes from the superior longitudinal sinus of an infant is safe and practical.

2. An ordinary Luer syringe and hypodermic needle are all the apparatus required. (This applies both in the case of withdrawal of blood and of injections; a 21- or 23-gauge needle an inch long is recommended.)

3. Transfusion of blood by the sinus route is safe, and can be done by the general practitioner in the average home.

4. Injections of medicinal solutions are safe, and in many instances the solutions thus injected act promptly.

5. The use of the sinus route need not be considered a last resort.

REFERENCE.—¹*Arch. of Pediatrics*, 1919, xxxvi, 72 (abstr. in *Surg. Gynecol. and Obst.* 1919, Aug., 104).

INFANT FEEDING.*Frederick Langmead, M.D., F.R.C.P.*

BREAST-FEEDING.—F. B. Talbot¹ writes on the technique necessary in obtaining samples of breast milk for analysis, and the interpretation of the results. In many instances when a sample has been sent for analysis, the practitioner has not been sufficiently familiar with the normal composition of human milk and its variations under normal conditions to interpret from the result of the examination whether the milk is normal or not: in consequence many babies have been deprived of their mothers' milk unnecessarily. It should be a rule that no infant is weaned prematurely until it has been proved that the milk is harmful or that its composition is abnormal. The composition cannot be said to be abnormal until it is found to be outside the limits of the normal variation, a variation which is greater than has formerly been taught.

Moreover, a sample to be representative must be obtained in one of two ways: (1) All the milk should be drawn or expressed from one breast and sent either in bulk or in a mixed sample to the chemist. The only way to ensure that all the milk had been withdrawn would be to weigh the baby before and

after each feed during the preceding twenty-four hours, in order to determine how many ounces are taken on an average. (2) One ounce of milk should be obtained before nursing and another afterwards. These may be analyzed separately, or mixed, but if the former, the two must be averaged. One or other of these methods is necessary, because the percentage of fat is much lower at the beginning of nursing than at the end, differing sometimes by as much as 10 per cent. The lactose varies similarly, though the discrepancy is less than with the fat. The time of day has also an influence on the composition. The highest percentages of fat are at noon and in the afternoon, and sometimes are so high that, if taken alone, they would be considered abnormal. The best time to take a sample is at 9 or 10 o'clock in the morning.

The author criticizes the analytical methods often employed. The usual method is somewhat as follows: First, the fat content is determined by the Babcock method, which is sufficiently accurate; next the proportion of sugar is regarded as constant and is fixed at 7 per cent, and the protein content is obtained by subtracting the assumed and known constituents from the solids. Such a method is very inaccurate, because there is a normal variation of from 6 to 8 per cent in the amount of lactose. The protein and the lactose should be separately estimated. Pathological chemical variations in human milk, he finds, are far less common than the text-books lead us to suppose.

That analysis of the various chemical constituents of the milk does not alone explain malnutrition of the otherwise normal infant is emphasized by the work of Kaupé² and other German observers. Malnutrition was recognized as common among the children of Germany during the war, but neither the amount of breast-milk obtained by them, nor its content of fat, was found to be unsatisfactory. The complement of accessory food factors, which defy analysis, must loom large in all such considerations.

ARTIFICIAL FEEDING.—One of the first considerations in the artificial feeding of infants is the provision of a clean and sound cow's milk, not pasteurized, not condensed, and not dried. A considerable step in this direction has been taken by the granting of a Government certificate to milk which fulfils certain requirements. A milk under the name of Grade A certified milk is now on the market, but unfortunately is not easy to procure in many localities. No doubt this difficulty will grow less as it becomes better known and more frequently asked for. This guaranteed milk is obtained from tuberculin-tested cows, is bottled at the farm, must contain no more than 30,000 micro-organisms per cubic centimetre, and *B. coli* must be absent. It is cooled at the farm as soon as milked, and contains no preservative. Another milk known as Grade A (uncertified) shares many of the advantages of Grade A certified milk, being obtained under clean conditions subject to inspection, and is also procured from herds satisfactorily tested and shown to be free from tubercle. The cost of Grade A certified milk is 5d. per quart more than ordinary milk, and that of Grade A 2d. more. The cost of even the more expensive variety should not preclude its extensive use, for if the amount of sour and stale milk which is thrown away almost daily in the summer be taken into consideration, its purchase is found to be a true economy.

Any procedure which prevents a dirty milk from turning sour is a danger to the community, for, among other things, it permits of the mixing of milks of succeeding days. Thus the common practice of pasteurization covers a multitude of sins. Ford³ has pointed out that milk heated to 80° or 85° C. for twenty or thirty minutes and kept at 37° C., decomposes with the elaboration of definite poisonous substances. Again, though the heat destroys vegetative bacteria, their spores remain, so that all pasteurized milk should be kept at a

low temperature to prevent the spores developing, and should be used within a short time of the heating. The occurrence of toxic substances in heated milk, arising from the development of spore-bearing bacteria, necessitates a rigid supervision of milk production, to prevent the entrance of organisms of this character before pasteurization.

Top-milk Mixtures.—Hyman Goldstein⁴ rightly emphasizes the prime importance of keeping the baby at the breast, and of very carefully excluding all other causes of failure before blaming the mother's milk. Should artificial feeding be necessary, he regards methods based on the calorific values of food and the percentage of the different ingredients in the milk mixture and top-milk mixture as the most scientific and the most practical. The calorific values can easily be computed if it is borne in mind that during the first six months an infant requires about 110 to 120 calories per kilo of body-weight, and for the next six months about 100 calories per kilo.

When milk stands for more than twelve hours, the top 10 ounces represents 10 per cent of cream, the top 16 ounces 7 per cent, and the top 20 ounces 6 per cent, the proteid remaining at 3.9 per cent and the sugar at 4.75 per cent. In prescribing a suitable formula, these top-milks are the only ones necessary.

The author lays down the following rules:—

1. Decide on the formula needed, the number of ounces in each feed, and the number of daily feedings.

2. Note the relationship of fat to proteid in the formula, and use for dilution a top-milk with the same proportion.

3. Add the sugar best adapted in making up the required percentage. Milk sugar is best tolerated by most infants.

4. After the third month, substitute barley- or oatmeal-water for the boiled water in the formula, the former for babies having loose stools, the latter for those who are constipated. Add one tablespoonful of barley or oatmeal to 16 ounces of water, and cook for one hour in a double boiler. Keep the water up to 16 ounces.

5. Give detailed instructions to the mother or nurse on the following points: (a) All the food needed for the twenty-four hours should be prepared at one time, preferably in the morning. (b) Regular feeding. (c) Each feeding should contain the same amount of food. (d) Prepare the food exactly as ordered. (e) Keep the prepared milk in stoppered bottles on ice until feeding time, then place the bottle in water at a temperature of 100° F. to warm the milk. (f) When the milk is warm, a clean boiled nipple should be placed on the bottle. (g) Test the warmth of the milk by allowing a few drops to run on your wrist. (h) Do not give the baby a nipple to suck when it cries. (i) Do not use ordinary home utensils for preparing the baby's food.

Dried Milk.—V. Borland⁵ has devised a rough-and-ready plan for determining the amount of dried milk necessary for infants in accordance with their weight. It was found that by adding the number 9 to the weight if below 7 lb., and the number 10 to the weight if from 7 to 16 lb. inclusive, the required number of level teaspoonfuls of dried milk to be given in twenty-four hours was obtained. For infants of 17 lb. and upwards, when the infant is having four feeds in the twenty-four hours, the second figure of the number of pounds' weight is taken as one feed. Thus, if the weight is 17 lb., then four feeds are given, each containing 7 level teaspoonfuls of dried milk. Only full-cream dried milks are intended—i.e., milks which are reconstituted by a dilution of 1 in 8—one level teaspoonful of dried milk to an ounce of water. The calculation is not regarded as a true estimation of the individual child's needs, but as a guide. Quite apart from the widely varying needs and powers of assimilation and digestion in different infants, and in the

same infant at different times, the great variations in the volume of a level teaspoonful rob the method of precision. Precision, however, is not claimed for it.

Infant Feeding and Marasmus.—As W. McKim Marriott⁶ points out in an article on the artificial feeding of athreptic (marasmic) infants, we are confronted in such cases with the problem of giving a large amount of food to an infant whose digestion and absorption are poor. The food may be introduced parenterally in the form of glucose, the intravenous injection of which is a valuable but temporary expedient when the need for food is imperative. Tolerance for food may be enhanced by blood transfusions or intravenous injection of a gum-acacia saline mixture. There still remains, however, the need for providing a food containing the elements essential to nutrition and capable of being given in large amounts without causing gastro-intestinal disturbance. These considerations led the author to try undiluted **Lactic-acid Milk** containing amounts of fat up to that in whole milk. His results convinced him that the majority of weak, marasmic infants tolerate undiluted lactic-acid milk extremely well in fairly large amounts. For infants under two months of age the milk had been given somewhat diluted, but there was no evidence to show that this is essential.

The next step was an attempt to increase the calorific value by the addition of carbohydrates, and for this purpose commercial glucose or 'corn syrup' was used. It produced little or no tendency to diarrhœa, even when as much as 10 per cent was added. Not only was it possible to add this form of carbohydrate to whole lactic-acid milk with impunity, but in 5 per cent solution it could be given almost *ad libitum* between meals. To prepare lactic-acid milk, whole milk is sterilized by boiling, cooled to room temperature, inoculated with a culture of Bulgarian bacillus or other lactic-acid-producing organisms, and incubated over night. If properly prepared, it is thick, creamy, and homogeneous, and not separated into curds and whey. The commercial glucose, or 'corn syrup', contains from 80 to 85 per cent of carbohydrate by weight, or from 110 to 120 per cent by volume. Mixing 45 volumes of the thick syrup with 55 volumes of water provides a thin syrup containing approximately 50 per cent of carbohydrate. This may be measured and added to the lactic-acid milk. No further sterilization is done, but the mixture is kept in a refrigerator until used. A nipple with a large hole is necessary.

It is advisable to begin with a mixture of equal parts of whole lactic-acid milk and buttermilk (fat-free lactic-acid milk), or, in the case of infants convalescing from diarrhœa, with buttermilk alone. If this is tolerated, the proportion of whole lactic-acid milk is gradually increased until only whole lactic-acid milk is given. The syrup is then added, at first in a proportion of 3 per cent, and if no diarrhœa occurs it is gradually increased, its amount depending on the infant's tolerance and the presence or absence of a gain in weight. Four-hourly feedings were almost the rule. The amount of carbohydrate added varied up to 10 per cent, and the total amount of sugar content up to as high as 15 per cent. The result obtained in the cases of 40 marasmic infants, varying in age from 1½ to 18 months, was a satisfactory gain in weight without the tendency to ordema or flabbiness met with in condensed-milk babies, the protein and fat content being high as well as the carbohydrate. Its advantage is its high concentration, thus providing a food of high caloric value in small bulk and in a comparatively small number of feeds.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, Aug. 30, 662; ²*Monats. f. Kinderh.* 1918, 15, 83; ³*Amer. Jour. Dis. Child.* 1919, Sept. No. 3 (abstr. in *Jour. Amer. Med. Assoc.*, 1919, Sept. 20, 935); ⁴*New York Med. Jour.* 1919, Sept. 6, 409; ⁵*Lancet*, 1920, i, 89; ⁶*Jour. Amer. Med. Assoc.* 1919, Oct. 18, 1172;

INFANTILE DIARRHŒA AND VOMITING.

Frederick Langmead, M.D., F.R.C.P.

The rôle played by micro-organisms in the etiology of infantile diarrhœa and vomiting is ill-defined. The Finkelstein school holds that they are of small importance and rarely the determining cause; others take the contrary view, and regard them as the essential factor. Confusion is increased by forgetting that diarrhœa and vomiting are, after all, only symptoms, and by attempting explanations to cover all cases. Excessive fermentation of sugar and its results covers nearly the whole field according to the tenets of the Finkelstein school. Almost the only points of general agreement are that these contentious cases of diarrhœa and vomiting are much commoner in bottle-fed babies, and in those under conditions of poor hygiene, and increase greatly in number in the summer months.

It may be asked what is the part played by infection. Finkelstein regards bacteria and their toxins as of no importance except in their influence upon sugar fermentation. The question as to the infectivity of this malady cannot, we think, be so easily set aside.

G. Douglas Sherwood¹ has put on record an investigation which is interesting in this regard. At a home opened in 1892 and continued until 1916 (25 years), where an average of 17 infants from one month to two years old were lodged, fed, and clothed each year, diarrhœa was seldom absent for the first three years, and 6 deaths resulted from it. For the remaining twenty-two years no case of diarrhœa originated in the home, and there was no fatality from this cause. This improvement is ascribed to a strict system of dealing with the children, which was inaugurated during the third year.

The chief points in the régime were: (1) The food was kept in a larder and, except at meal-times, was out of all contact with the children and their service; (2) A separate room was used for the changing of napkins, and, where possible, a separate nurse for the toilet; (3) The nates were washed and bathed with a disinfectant; (4) The nurses' and babies' hands were disinfected; (5) The napkins were immediately placed in a disinfectant.

Considering the relative importance of these five points: The larder is but a means of preventing contamination of food by germ-laden dust and flies, and hence infection of the child. The separate room is but a matter of treating the child with the same decency and care as is meted out to the adult. If the washing of the hands and nates were neglected, though the neglect would leave open a source of infection to the individual child, in the hot months the nates and hands are always damp to some extent from perspiration, and hence the faecal matter does not so readily dry as to form a danger to others. But the placing of the napkins in disinfectant puts the largest and most easily dried source of infection of the community completely out of court; the author considers it the measure of greatest importance as far as the safety of the many is concerned.

If a child vomited (excluding simple regurgitation of food), it was removed immediately to an isolation room; its clothes were taken off, and it was bathed completely. It was then put into clean clothes. No milk was given for several hours, and the mouth was washed out at frequent intervals with a solution of borax in water. Regarded as a further possible source of infection were the spots of clean milk which are unavoidably splashed on the child's clothing during feeding. As a prophylactic measure, when the clothes were laundered, they were rinsed in borax and water before being ironed.

The possibility of a parent or nurse as a source of infection has to be considered. A case in point arose at the home. A child arrived in a pitiable condition due to gastro-intestinal disturbance, and was isolated and placed

under the strict system of the home. As it failed to benefit in the usual manner, all possible causes for the persistence of the trouble were investigated. It was found that the mother was continually kissing the child, and when examined she was found to have a mouth full of carious teeth. After this was prevented and the teeth were attended to, the child made a rapid recovery. The author's plea is for the application of surgical cleanliness to the nursery.

J. Zahorsky,² as the result of an examination of the stools of 300 infants suffering from diarrhoeal diseases, is convinced of the importance of such examinations as a routine, in order to distinguish the functional from the inflammatory forms. It is his practice to examine all stools in regard to their cell content.

Marfan,³ writing on *habitual vomiting in infants*, considers that it is of more moment to get the child fed than to check the vomiting. When breast milk is unobtainable, his first choice is asses' milk, and his second skimmed cow's milk, believing that it is the cream which causes most disturbance. To the skimmed milk he adds 10 per cent of sugar, to increase its nutritive value. Kefir and buttermilk he finds usually too acid, though they sometimes suit; he dilutes them with one-third water and one-third lime-water. Should the infant be three months old, he adds a thin gruel with or without maltose; if over six months, a little thicker gruel or *bouillon de légumes*, with increasing proportions of milk.

In serious cases the feedings should be very small and at short intervals. Thus, for a baby of two months, he advocates resting the stomach for twelve hours, permitting only one or two teaspoonfuls of ice-water every half-hour, and following this by spoon-feeding, giving a teaspoonful of the breast milk or substitute, ice cold, every fifteen minutes. Sucking, he considers, provokes the vomiting reflex. If, during six hours, any of this is retained, he gives 2 and then 3 teaspoonfuls every half-hour for six hours, and for the last quarter of the day 4 or 5 teaspoonfuls. The child is then allowed to sleep undisturbed for six or seven hours. Thereafter the amounts are gradually increased and the intervals lengthened until breast-feeding is resumed. By following this plan he finds that usually, though there may still be occasional vomiting, there is enough food retained to cause a gain in weight.

Should the vomiting persist, he feeds the infant by a medicine dropper, giving the food by dropping it into the mouth, a drop at a time, every three or four minutes.

Hot Enemata (104°-112° F.), he considers, assist to combat the vomiting. **Bismuth** may be useful when given before the feeds to provide a protective coat to the stomach; he prescribes a teaspoonful of a mixture of 30 gr. of bismuth subnitrate in about 3 oz. of equal parts of gum mixture and syrup of poppies; on the other hand, 4 gr. of the bismuth may be added to each feed.

Hot Compresses applied to the stomach and abdomen, renewed every hour for five or six hours, may be indicated in the more serious cases. The child can be put in a **Hot Bath** twice a day for ten minutes. Another measure which he has found valuable, when other treatment has failed, is gentle **Massage** of the abdomen twice a day for five minutes with **Camphorated Oil of Chamomile**. In these grave cases sedatives are called for, and he prefers **Tincture of Belladonna** to opiates, and adds to it **Bromide** and **Sodium Bicarbonate**. **Gastric Lavage** he considers to be sometimes useful, but liable to cause convulsions under certain conditions.

Diarrhœa in Breast-fed Infants.—As Marfan⁴ points out, diarrhœa not infrequently appears in infants at the breast, but in its primary form is almost never associated with infection or intoxication sufficient to present severe or abiding symptoms. It has no profound effect on the nutrition, and is rarely

of a serious nature. He opposes the view held by many that breast-feeding should be discontinued for a time, and considers it necessary only in quite exceptional cases. Nor is a change of nurse desirable.

TREATMENT.—For slight diarrhoea he recommends that during the first day the intervals be lengthened to four hours, and the time at the breast reduced to five or six minutes. During the intervals the infant should be given a few spoonfuls of plain **Boiled Water**. On the second day the intervals are somewhat shortened, and on the third the duration of nursing may be slightly lengthened. Thus, gradually, a return to normal is achieved. In severe cases, three or four feedings are omitted and pure boiled water substituted.

REFERENCES.—¹*Lancet*, 1920, i, 906; ²*Missouri State Med. Assoc. Jour.* 1920, Aug., 317 (abstr. in *Jour. Amer. Med. Assoc.* 1920, Aug. 28, 634); ³*Nourrisson*, Paris, 1919, July, 203 (abstr. in *Jour. Amer. Med. Assoc.* 1919, Sept. 6, 797); ⁴*Ibid.* 1920, Jan., 1 (abstr. in *Ibid.* 1920, May 8, 1355).

INFANTILE MARASMUS. (See INFANT FEEDING.)

INFECTIOUS DISEASES PREVENTION. *Joseph Priestley, M.D., D.P.H.*

Encephalitis Lethargica in a Girls' Home.—A small outbreak investigated recently furnishes some interesting details, not least of which is that the filtered emulsion from the brain of one of the victims, when inoculated into a monkey, produced the disease in that animal. There were 12 cases in all (5 deaths) out of a total of 22 inmates in the girls' home (3 staff and 19 resident girl inmates). Each inmate occupied a separate bedroom. Prior to the outbreak the health of the whole of the inmates was good and the sanitary condition of the premises satisfactory. The outbreak was explosive, 10 cases occurring within three days, 1 on the fifth day, and 1 on the thirteenth day after the first case. The ages of victims ranged from 15 to 40 years. Marked lethargy and double ophthalmoplegia, with other general and nervous manifestations, were noticeable symptoms in all the cases except one. The cases of the three members of the staff were 'abortive'. The source of the outbreak could not be traced. The type of the disease was the common type, as described in the Vienna outbreaks—implication of the third pair of cranial nerves. Death in the five fatal cases was rapid. The possibility that the outbreak was due to the toxic effects of some alkaloid or other drug was considered and excluded—e.g., *Atropa belladonna* or botulism. The former (*Atropa belladonna*) was excluded owing to the presence of sweating and the absence of the peculiar chattering delirium (semi-wakeful), and the latter (botulism) owing to the presence of definite lethargy and coma. The results of the post-mortem examinations were not characteristic, due probably to the rapidity of death in the fatal cases—i.e., before the characteristic inflammatory reaction generally met with in the brain and central nervous system had had time to develop. In this connection, the inoculation experiment with the monkey is most significant, as the animal showed during life symptoms of encephalitis lethargica, with well-marked characteristic pathological lesions after death on post-mortem examination—the only case on record of indisputable experimental transmission of this disease from a human being to an animal. The large number of cases in a confined area is a noteworthy epidemiological fact, and the definite clinical symptoms (with involvement of the third cranial nerve nuclei) a noteworthy clinical fact, connected with the outbreak.

The official preventive measures were the obvious ones—isolation of the patients at an isolation hospital, and the stopping of all new admissions to the home. The usual disinfection was carried out, as necessary.

A word or two as to treatment may be of interest. Confinement to bed, and a diet of milk and water, with lumbar punctures as required to relieve pressure in the cerebrospinal canals, were the general lines of treatment followed, together with careful nursing, day nurses and night nurses being specially engaged. A food origin for the outbreak was excluded after careful inquiry. No other cases of encephalitis lethargica had been recently notified in the district. (*See also ENCEPHALITIS LETHARGICA.*)

Food-poisoning Outbreak (Paratyphoid B).—If it were reported that a human experiment had been made upon a household of 10 persons by inoculating a certain article of diet used in common, with the result that they all sickened with violent symptoms of gastro-intestinal inflammation, and that 2 died, it might be thought that the report on the face of it was manifestly exaggerated and based rather on theoretical than upon practical considerations. Such a thought would not be justified, judging by an actual outbreak of food poisoning in a large Metropolitan borough, where a household of 10 persons was poisoned with steak-and-liver gravy, accidentally and unintentionally inoculated by the cook with an organism belonging to the 'mutton' type of the large paratyphoid B group, which has been comparatively recently described and named, including a large number of the strains formerly referred to as *Bacillus supestifer* or *Bacillus aertrycke*, frequently associated with food-poisoning outbreaks. Of the 10 victims, 2 died, inquests being held in each case (after post-mortem examination), with the verdict "Death from gastro-enteritis by food-poisoning misadventure", in accordance with the medical, pathological, and bacteriological evidence which was laid before the coroner. The particular organism mentioned above was found in the organs of one of the deceased victims, who died four days after attack, and was also found (practically in pure cultivation) in some steak-and-liver gravy. The remaining 9 victims reacted with their bloods to the bacteriological test, causing agglutination of the same paratyphoid B (large) group culture—i.e., showing that such bloods contained agglutinins for such organisms. In one case the same germ was isolated from the faeces. The second victim who died gave, during life, the agglutinin reaction with her blood, but did not die until twenty-one days after attack. The post-mortem examination disclosed that in her case there was a double bacillary infection, viz., (1) large paratyphoid B ('mutton' type), (2) 'proteus' type, the latter being the terminal cause of death. The 'proteus' type of organism was isolated from this victim's urine ante mortem.

The outbreak being limited to one household, exact investigations were able to be carried out on all points, and samples of various foods (partaken of prior to the outbreak) were available for bacteriological investigation, with the exception of some parsley butter, which was served with boiled haddock, and which came under suspicion, having been partaken of by two of the victims twenty-four to forty-eight hours prior to their gastro-enteritic attacks. The chief infected article was the gravy of a steak-and-liver pudding, from which the causative germ was isolated. The evidence showed that the inoculating agent was the cook (the mother of the family of the household), who had herself had an acute attack of gastro-enteritis a few days previous to the outbreak, and who three days previous to her own attack had paid a visit to Margate, going and returning by boat on the same day. This inoculating agent was regarded as either: (1) A 'carrier' in the bacteriological sense (it being assumed that her latent disease and infection had been roused into activity by a chill contracted whilst going to Margate by boat); or (2) A first case, infected at, or whilst going to or coming from, Margate. Whichever view proves to be correct, the fact remains that the inoculating agent was herself taken ill with

exactly the same symptoms as the other victims of the outbreak, *but two clear days previously*, during which, though ill, she did the cooking for the household, the food consisting of boiled haddock and parsley butter, steak-and-liver stew, and ribs of beef and Yorkshire pudding (with some of the gravy of the steak-and-liver stew poured over it). The whole of the 10 inmates of the household partook of the boiled haddock (and parsley butter) and the ribs of beef (and Yorkshire pudding, soaked with the steak-and-liver gravy), and all sickened with gastro-enteric symptoms within twelve hours of doing so. In this connection, it is interesting to note that the father did not partake of the ribs of beef and its accompanying Yorkshire pudding soaked in steak-and-liver gravy until twenty-four hours after the others, and sickened twenty-four hours after them! It is also noteworthy that the father partook of the steak-and-liver stew in the form of pudding on the previous day, but it had no ill effects, owing to the fact that he took the pudding to his work and boiled it up at his work-premises before partaking of it. The gravy (in part) of this steak-and-liver stew was poured over the Yorkshire pudding (which was served with the ribs of beef), and caused illness in 7 persons who partook of it, the symptoms developing within twelve hours. The gravy, in this case, had not been previously 'boiled up', but merely 'warmed up'.

The symptoms of all the infected persons were feverishness, rapid pulse, sickness, diarrhoea, abdominal pains of a colicky nature, exhaustion, and nervous prostration. The similarity of the symptoms and the simultaneous nature of the attacks are specially noteworthy. It was definitely proved that the cook was the transmitter of the particular germ described above from herself to certain articles of food, which caused the same acute attacks in all of those persons who partook of such infected food—the symptoms of all the patients being the same as her own symptoms, and the bloods of all the patients giving the same agglutination test with the particular special organism in question, as did her own blood on being tested. This cook had a relapse four days after her first attack, from a re-infection of herself through the steak-and-liver gravy, which she herself had originally infected!

Japanese Anthrax-infected Shaving-brushes.—An interesting series of cases of anthrax inoculations of the human subject through the medium of shaving-brushes has been traced—a total of 21 cases in different parts of the country (6 in London), the lesion in every case being situated on the shaving area of the person inoculated. Of the 21 inoculated persons, 6 died. In 17 cases the diagnosis of anthrax was confirmed bacteriologically, and in 15 the suspected brushes were found to be anthrax-infected on bacteriological examination—either the actual brushes in use by the infected persons, or one or more brushes of the same batch and pattern.

As showing the difficulty in tracing an outbreak, on account of the large numbers of articles (brushes) concerned, it may be stated that one Japanese consignment of 650 gross was sold to one wholesale firm in England, and this firm re-sold in lots to 10 other wholesale firms, which in their turns re-sold, in small retail lots of a few dozens each, to over 100 retail firms for sale in the United Kingdom, India, Ceylon, Iceland, Cyprus, and Egypt. That Japan was to blame there can be no reasonable doubt, as many of the infected consignments were traced to that particular country, and numbers of brushes (with and without pattern numbers) were found on bacteriological examination to be contaminated with anthrax. Many of the brushes were consigned wrapped up in sheets of paper marked "Sterilized and free from anthrax"; and some of the consignments were even accompanied by an official document signed and sealed by a representative of the local Japanese Prefectural Government to the same effect!

Administrative action was taken by the Ministry of Health, by the issuing of an Order in Council under the Anthrax Prevention Act of 1919, prohibiting, for the time being, further importation into the United Kingdom of shaving brushes manufactured in, or exported from, the Empire of Japan. This Order in Council came into force on Feb. 9, 1920. Warning notices were sent to all known wholesale dealers in shaving-brushes in the United Kingdom, and were also published in the press, with the result that many brushes were surrendered to sanitary authorities, or disinfected, the Ministry of Health suggesting a warm formalin solution of the strength of two tablespoonfuls of formalin to half a pint of warm water for that purpose.

Tuberculosis Prevention up-to-date.—Any scheme of tuberculosis prevention to be successful must include treatment. The sooner the intimate inter-relationship of curative and preventive medicines in connection with tuberculosis is recognized and admitted, the better. Again, erroneous and misleading statements, accepted by the medical profession in regard to this particular disease (in its pulmonary form, especially), must be swept away; and, in this connection, the year 1920 will be noteworthy as being the year in which Dr. Paterson, a tuberculosis officer of wide experience, has had the courage to issue his book on *The Shibboleths of Tuberculosis* (John Murray, London). These catch phrases or cries, to which the medical profession still adheres, must be swept away, and the cobwebby and dusty crevices wherein they have lurked and incubated for years and years past, and are still lurking and incubating to-day, must be disinfected and cleansed, if any real advance is to be made in the treatment and eradication of tuberculosis. Dr. Paterson tabulates 59 shibboleths, which may be summed up as follows, in concentrated form: That tuberculosis is an hereditary disease as shown, *inter alia*, by clubbing of the fingers, and may be, as a disease, divided into the three distinct forms—acute, subacute, and chronic; that once a patient is tuberculous, he or she is always tuberculous; that knowledge of the activity of the disease can be ascertained from the physical signs alone, and that a tubercle-bacilli-positive examination of the sputum is in itself evidence of activity of the disease, whereas a tubercle-bacilli-negative examination of the sputum is evidence of no tuberculosis; that a subcutaneous tuberculin reaction is evidence of active tuberculosis, that the von Pirquet test is also proof of activity, that the opsonic index is of no use, and that a blood inoculation is also useless; that, clinically, it is possible to distinguish between influenza and pulmonary tuberculosis; that active tuberculosis can be detected by the *x* rays; that hæmoptysis is a sign of active tuberculosis, and that hæmoptysis in young persons often proceeds from varicose veins in the throat; that pleurisy in young persons is not diagnostic of tuberculosis, that it is possible to diagnose a pleural effusion by physical signs alone, that acute serous tuberculous pleural effusions should be aspirated, and that it is a good practice to open a tuberculous empyema and to scrape a tuberculous larynx; that exertion causes hæmoptysis, and that, for its treatment, cold drinks and foods (much restricted in amounts), and the sucking of ice, are good. Speaking generally, all the above shibboleths are simply catch phrases or cries, to be swept away, and their places taken by the following up-to-date idea, viz.: That tuberculosis is a blood disease or infection, due to the entrance into the body of the tubercle bacillus, which may 'catch on', or become localized, in the lungs or in any other organs of the body (no organ being exempt), and which is naturally attacked by the 'antibodies' that are produced in the blood by auto-inoculation; and can be regulated by graduated exercises, with alternating complete immobilization as may be required whenever the temperature of the patients' bodies rises above normal, thereby assisting Nature, and treating the disease by increasing the patients' own *vis medicatrix nature* or autogenous vaccines.

The above remarks deal with the clinical aspect of the disease, but Dr. Paterson does not stop there. He tabulates many shibboleths dealing with prevention, and these may be grouped as follows: That 'open air' is curative treatment for tuberculosis, and that night air is prejudicial to tuberculous patients, whilst great altitudes and pine trees are necessary for, or in, the treatment of the disease, as is also a special diet; that sanatoria are no good or even harmful, and are depressing places, but, if used, should be built of wood so that they can be periodically burnt down, and so designed that the wards face the south; that it is dangerous to visit a tuberculosis hospital; that persons suffering from tuberculosis should be segregated; that good housing will eradicate tuberculosis; that carbolic acid kills tubercle bacilli in the sputum; that sputum should be burnt; that any spittoon is a good sputum pot; that going to Bournemouth or to the seaside is good treatment for tuberculosis, as are also a sea voyage, a warm climate, and emigration (i.e., change of climate); that farm colonies are necessary for the after-care of tuberculous persons; and that persons who have or have had tuberculosis should not marry.

Finally, there are the following shibboleths in regard to treatment: That inhalations are curative agents in tuberculosis, that cod-liver oil is necessary, and that aspirin is useful. These 'treatment' shibboleths will die hard! Inoculation tests of sputum and blood (for tubercle bacilli) should always be undertaken when microscopical examinations yield negative results. Fattening tuberculous patients unduly is unwise.

Typhoid 'Carrier' as a Danger.—A woman was confined recently in the lying-in department of a hospital. The birth was premature, and the mother suffered from what was diagnosed as puerperal pyelitis, but what was really pyelitis due to the typhoid bacillus, which was accidentally found to be present in the urine. The patient was in the lying-in wards for nearly twenty-eight days without the typhoid bacilluria having been diagnosed, with the result that three nurses in attendance in the same wards contracted typhoid fever—each within the incubation period of three weeks. The patient was finally removed to a fever hospital, disinfection was carried out, and contacts were medically inspected for the usual incubation period of the disease. No other case arose.

INFLUENZA.

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—According to the Registrar-General's Annual Report,¹ the total number of deaths due to the epidemic in England and Wales during 1918 appears to have been rather over than under 140,000. Of these deaths, 112,329 were certified, and the remainder were estimated, as due to influenza. Of the 112,329, 53,883 were males and 58,446 females. After deducting 7591 deaths among non-civilian males, the 104,738 civilian deaths correspond to 3129 per million civil population, an epidemic mortality not hitherto approached in this country since registration commenced, the cholera epidemic of 1849 (with 3033 deaths per million population) alone being excepted.

In their account of an epidemic of influenza among American troops in England, F. M. Meader, J. H. Mearns, and J. G. Hopkins² state that the mortality was about twice as high on board transports as on shore, viz., 4 per 1000 a month at sea, and 2 per 1000 a month on shore. The higher mortality in the transports is attributed by them to various debilitating circumstances, such as unpalatable and insufficient food, broken and insufficient sleep, poor ventilation, overcrowding, and exposure to cold and wet; but most of all to the virulence of the infecting organism. The troops were all newly recruited, and came from cantonments where a highly virulent organism was prevalent.

A comparison between the epidemic of 1889-90 and that of 1918, as regards the mortality at different ages, is furnished by Florschütz's³ statistics of the Life Insurance Bank at Gotha. During the earlier epidemic, no death occurred in the age period 15 to 30, and only a few from 30 to 60, and it was not until old age that the deaths became more numerous. In 1918, on the other hand, the percentage of deaths between 15 and 30 was only exceeded by that between 81 and 90. Between the two extremes there was a fall in the mortality, which reached its lowest point between the ages of 51 and 60.

A. Edelmann⁴ emphasizes the enormous mortality of the recent pandemic as compared with that of the nineties, when a very high morbidity was associated with an extremely low relative mortality. He suggests that the recent pandemic may be identical with the 'black death' of the Middle Ages, the infection being the same as in the pandemic of 1890, but the *genius epidemicus* different. A similar occurrence is frequently seen in the case of the acute exanthemata, especially scarlet fever.

BACTERIOLOGY.—From a study of a large series of cases throughout four epidemic waves, Rosenow⁵ found green-producing streptococci, including pneumococci, to occur more constantly and in larger numbers than any other organisms commonly associated with the disease. These organisms predominated alike in cases with and without lung involvement. During the latter part of the outbreak, hæmolytic streptococci became relatively more numerous, especially late in the disease, and death was often the result of invasion by these organisms. *B. influenza* was found in the sputum in the early part of the first wave only in a few cases, and always in association with streptococci, while throughout the remaining three waves it was isolated only occasionally.

By inoculating monkeys in the nose and mouth with *B. influenza*, Francis G. Blake and Russell L. Cecil⁶ produced an acute infection of the upper respiratory tract apparently identical with influenza in man, and occasionally complicated by acute sinusitis, tracheobronchitis, and bronchopneumonia. Intratracheal injections of the same strain of *B. influenza* produced a tracheobronchitis and bronchopneumonia, the pathology of which appeared to be identical with that of influenzal pneumonia in man. In view of these facts, and the constant association of *B. influenza* with early uncomplicated cases of influenza, the writers conclude that *B. influenza* is the specific cause of influenza.

MORBID ANATOMY.—H. Bakwin⁷ gives the following résumé of the autopsy findings in 106 cases of influenzal pneumonia: (1) Cloudy swelling of the parenchymatous organs and heart muscle, and hæmorrhages into the pericardium, renal pelvis, and other viscera; (2) Changes in the rectus muscles were observed in 33 per cent, and consisted in an unusual pallor, dryness, and opacity, with hæmorrhages into the muscle substance; (3) Empyema was rare, occurring in less than 4 per cent of the cases; (4) Acute laryngitis was comparatively rare, occurring in only 6 out of 36 larynges examined; (5) Sphenoidal sinusitis was a very common complication, being found in 20 out of 22 cases examined.

D. Symmers⁸ found intense injection of the suprarenal medulla a common post-mortem lesion, which was sometimes associated with hæmorrhagic extravasations into the substance of the gland, or even with thrombosis of the suprarenal veins. A partial explanation is thus afforded of the low blood-pressure as well as of the profound asthenia characteristic of the disease.

From examination of 17 cases, B. Lucke and R. Barker⁹ found that endothelial cells constituted the predominating type in the exudate of influenzal pneumonia, especially in the early stages, and that later they became gradually replaced by polymorphonuclear cells. The endothelial cells were found to be slightly phagocytic for red corpuscles, and occasionally engulfed bacteria.

SYMPTOMS.—J. Minet and R. Legrand¹⁰ describe a *cardiac form* of influenza, the symptoms of which vary according as the whole or part of the heart is affected. Cardiac influenza may be manifested by endocarditis, pericarditis with or without effusion, myocarditis, or nervous symptoms such as tachycardia, bradycardia, arrhythmia, and cardiac neuralgia. Most of the cases occur between 20 and 45 years of age. Hearts affected by previous infections are more likely to be attacked than healthy ones. The influenzal virus may rouse old lesions into fresh activity, create new lesions, and upset the cardiac equilibrium by affecting the nervous system. The prognosis is usually grave, and a fatal issue is frequent, especially when there is an organic lesion of the heart. Sudden death is not uncommon, and complications such as embolism, pyæmia, cardiac failure, and collapse may occur.

G. Deusch¹¹ has recently seen a number of cases of *post-influenzal dyspepsia*. None of the patients had suffered from gastric disturbance before their attack of influenza. In most cases the symptoms lasted several months. Disturbance of the motor functions of the stomach was relatively rare, but most of the cases showed some disorder of gastric secretion, sub- or anacidity being the rule.

G. S. Coskinas¹² records 19 cases of influenza in which pulmonary lesions such as congestion, bronchopneumonia, etc., were accompanied by small *aseptic pleural effusions*, which were sero-hæmorrhagic, sero-fibrinous, or less often puriform in character. The effusion might be transitory or of longer duration, occurring as a rule within the first few days of the disease, or more rarely at a later stage. In 13 per cent the fluid underwent a septic change.

Nervous System.—F. H. Stangl¹³ reports that nearly 1 per cent of 3400 cases of influenza at Cook County Hospital had symptoms suggestive of meningitis or cerebral involvement, and ranging from slight neck rigidity and unilateral or bilateral Kernig's sign, to deep delirium and marked rigidity of the neck, and in one case opisthotonos. The cases were divided into two groups, the first consisting of 8 cases in which a diagnosis other than influenza, such as cerebrospinal fever, uræmia, tuberculous meningitis, or apoplexy, was incorrectly made. The spinal fluid in these cases was constantly under increased tension, but the presence of globulin, albumin, and increase of cells was variable; the fluid was always sterile. The second group consisted of 21 cases diagnosed as influenza or influenzal pneumonia with meningism. The tension of the spinal fluid in these cases was increased, but the fluid was always clear, and there was no increase in the leucocyte count.

Other nervous complications reported by various writers in the recent pandemic are musculospiral paralysis, bilateral circumflex paralysis (Tanfani¹⁴), paralysis of the serratus magnus (Guillain and Libert¹⁵), facial paralysis (Porot and Sengès¹⁶), paralysis of the soft palate (Chodak¹⁷), abducens paralysis (Meyerhof¹⁸), bulbar paralysis (Nonne¹⁹), thrombosis of the superior longitudinal sinus (Szigeti²⁰), hemiplegia (Tanfani,¹⁴ Ordway²¹), epilepsy (Clark²²), chorea (Ordway²¹).

A. Gordon²³ discusses the *mental disorders* following influenza in a paper based on the study of 62 cases which developed at the end of the febrile stage during the period of asthenia usually succeeding infectious diseases: 44 showed a more or less pronounced confusional type of psychosis, with or without hallucinations, the symptoms being most marked in those with a psychopathic history; in the remaining 18 cases the most conspicuous feature was pronounced amnesia. In each group improvement in the mental condition coincided with improvement in the general physical state of health.

A. T. Todd²⁴ noted 16 cases of *thyroid involvement* among about 1500 cases of influenza. In only 6 were the signs well marked. With the exception of a girl, age 10, who developed hypothyroidism in convalescence, all the cases

showed varying degrees of hyperthyroidism. The time of onset of the thyroid symptoms and signs was very variable, but was sudden in all cases.

C. A. Roeder²⁵ reports 3 cases of thyroid adenomata which suddenly became very toxic after influenza, and 5 cases of hyperthyroidism immediately following influenza.

According to J. Meyer and B. Lucke,²⁶ *subcutaneous emphysema* is an exceedingly rare complication of influenza. In about 3000 cases of influenzal pneumonia it occurred in only 9 patients, or 0.3 per cent, and in a series of over 12,000 cases of influenza in only 0.07 per cent. It was most frequent in the neck region. As the result of their autopsies, they believe that the condition is due to the bronchial air escaping into the loose peribronchial tissues, invading the mediastinum, and thence along fascial planes gaining entrance to the subcutaneous tissues. In this way the pleural sacs are not involved, which accounts for the infrequency of pneumothorax in this condition.

W. W. D. Thomson and H. F. Macauley²⁷ report four cases of post-influenzal *nephritis* in the same family, the patients being children from four to thirteen years old in whom all other causes of nephritis could be excluded. Their conclusions are as follows: (1) Nephritis is a more frequent complication of influenza than is ordinarily thought. (2) The virus of influenza may affect the kidneys in various ways: (a) By producing a temporary albuminuria, as in many other acute infectious fevers; (b) By causing an acute nephritis in the course of the disease, especially if respiratory symptoms are present; (c) In convalescence, as in scarlet fever. (3) Nephritis occurring during influenza may be masked by the respiratory symptoms, and only careful routine examination of the urine may demonstrate its presence. (4) Nephritis may follow even mild attacks of influenza. (5) The urine should be carefully tested, not only during the disease but also in convalescence. (6) The frequency and severity of the complications vary in different parts of the world and in different epidemics. (7) In the next few years a higher percentage of albuminuria may be expected. (See also MEDICAL ANNUAL, 1919, pp. 205, 207; 1920, pp. 183-4.)

W. G. Bugbee²⁸ discusses the genito-urinary complications of influenza, and records 39 personal cases. In 22 there was infection of one or both kidneys, in 5 perinephritic abscess, in 4 prostatic abscess, in 6 epididymitis, and in 1 seminal vesiculitis: 14 of the renal cases had no previous history of urinary symptoms.

Surgical Complications.—J. A. Drey,²⁹ who regards epidemic influenza as an important factor in *appendicitis*, records five cases of post-influenzal *appendicitis* in persons who had no history of a previous attack, and has collected similar cases from the literature. As a general rule immediate operation is not required, but *appendicectomy à froid* after convalescence is advisable.

A. McGlannan³⁰ reports a case of *thrombophlebitis of the inferior vena cava* in the region of the hepatic veins, and also an *abscess* in the scar of an *appendectomy* which had been healed for nearly three years, following influenza.

In addition to *empyema*, other surgical complications reported in the recent pandemic include *orchitis* (Gargano³¹), *mastitis* (Gargano³¹, Nothnagel³² Mitterstiller³³ Prader³⁴), *osteitis of the radius* (Mitterstiller³³), *thyroid fistulae* following suppurative thyroiditis in goitrous subjects (Mitterstiller³³), *suppurative parotitis* and *arthritis* (Prader³⁴), and *mastoid abscess* (Blac y Fortacin³⁵).

Influenza and Pulmonary Tuberculosis.—From a study of 150 cases of pulmonary tuberculosis and 210 cases of influenza, W. Amelung³⁶ concluded that the incidence of influenza among cases of pulmonary tuberculosis was slight. The course of influenza, especially in slight cases of pulmonary tuberculosis, was milder than in the non-tuberculous, as is shown by the fact

that in the 15 cases who were all in the first stage of pulmonary tuberculosis the attack of influenza was uncomplicated. None of the advanced cases contracted the disease. Amelung also found that pulmonary tuberculosis might develop as a sequel of influenza in persons with previously healthy lungs, and that the association of the two infections had then a relatively unfavourable prognosis, 10 out of 14 such cases being fatal. J. E. Kayser-Petersen,³⁷ who has seen 11 cases of influenza develop in cases of pulmonary tuberculosis, agrees with most writers that the course of influenza depends mainly on the character of the tuberculous process. Incipient disease of the apex and mild forms of fibrosis are not affected usually, whereas the course of severe cases of pulmonary tuberculosis is usually aggravated by the supervention of influenza.

Influenza and Pregnancy and Childbirth.—Beuttner and Vulliéty³⁸ found the mortality among 48 pregnant or parturient women with influenza was 23·3 per cent. The mortality was highest in cases in which the influenza arrested the pregnancy, abortion or premature delivery following the onset of the influenza. The danger seemed to be greatest in young women and primiparæ. When influenza developed post partum, it ran a mild and uncomplicated course, probably owing to the hyperleucocytosis which is the rule in the puerperium. The death-rate among the prematurely born was 60 per cent, and 13 per cent among those delivered at term, showing the noxious influence of the bacterial poisons upon the fœtus. The writers point out that in the treatment of influenza in pregnant women it is important to refrain from quinine and other drugs liable to stimulate the uterus to contract.

The gravity of influenza in pregnancy is also illustrated by J. Andérodias,³⁹ who reports 29 cases of pregnancy complicated by influenzal bronchopneumonia, with 10 deaths. In 9 cases the fœtus died in utero or the mother died undelivered. One infant which was born prematurely died after fifteen days.

DIAGNOSIS.—S. T. Lec¹⁰ points out the following differences between influenzal pneumonia and *pneumonic plague* :—

1. *Epidemiological Differences.*—(a) Season: the recent outbreaks of plague in China all occurred in winter, being most marked in January, whereas the influenzal pneumonia in 1918 first appeared in the autumn, and reached its height in October. (b) Distribution: plague pneumonia was limited almost entirely to the labouring classes, while influenzal pneumonia, though more severe in unhygienic and crowded places, did not spare the better classes. (c) Infectivity: in plague a direct contact is always necessary for infection, whereas in influenza this is not so; proper precaution against plague pneumonia is an absolute protection, while this does not hold in influenzal pneumonia.

2. *Pathological Differences.*—In influenza pus is disseminated in the lung tissue, while in pneumonic plague pus is not formed in spite of the presence of pyogenic organisms, probably because the virulence of *B. pestis* inhibits the activity of the other organisms.

3. *Clinical Differences.*—In influenza there is usually a longer period preceding the manifestation of lung symptoms. When pneumonia does occur, it is a secondary complication. In plague, on the other hand, the lung symptoms are primary. The course of pneumonic plague is shorter; 60 per cent of the patients die within forty-eight hours, 16 per cent within twenty-four hours, and 16 per cent within seventy-two hours. The recovery-rate from pneumonic plague is almost nil, whereas in influenzal pneumonia many more patients recover, although the mortality is very high.

PROGNOSIS.—In a statistical study of 1653 cases of influenza, for the most part complicated by pneumonia or bronchitis, V. Bie⁴¹ shows the prognostic significance of heart disease, albuminuria, pulse-rate, temperature, and respira-

tion. Of 55 patients whose pneumonia was complicated by heart disease, 31, or 56 per cent, died, as compared with a mortality of 21 per cent among adult patients with pneumonia uncomplicated by chronic heart disease. Albuminuria occurred in 29 per cent of cases with pneumonia, and in only 4 per cent of patients without pneumonia; the mortality of patients with combined pneumonia and albuminuria was 83 per cent, and that of patients with pneumonia alone 12 per cent. The height of the temperature on admission had no prognostic significance. On the other hand, the pulse and respiration, especially the latter, were very important. A pulse-rate over 130 on admission was noted in 5 fatal cases, and only in 1 terminating in recovery. A respiration-rate of 40 or more was ominous, whereas the prognosis was relatively good when the respiration-rate was 35 or less.

PROPHYLAXIS.—Sir W. Leishman⁴² summarizes the results of **Inoculation** in the home commands in 1918–19 as follows:—

	Strength.	RATIO PER 1000.		
		Incidence of attack.	Incidence of pulmonary complications.	Deaths.
Inoculated ..	15,624	14.1	1.6	0.12
Non-inoculated	43,520	47.3	13.3	2.25

Nearly one-half of the inoculated received only the first dose of the vaccine, i.e., one-third of the amount considered essential to effective protection. It is probable, therefore, that if all had received the full dosage, the protective results would have been still more evident. No bad effects were reported, and the reactions in the overwhelming majority were trivial or non-existent. The formula of the vaccine now employed in the Army, and also by the Ministry of Health, contains *B. influenza* 400 millions (instead of 60 millions, as previously), streptococci 80 millions, and pneumococci 200 millions in 1 c.c. (*See MEDICAL ANNUAL*, 1919. p. 208.)

H. Greeley⁴³ made a vaccine comprising 17 strains of *B. influenza*, 0.25 c.c. containing 500 million bacilli, one dose of which he gave to each of 166 children. Although a considerable proportion had a more or less severe local reaction, which indicated that they were susceptible to infection, none developed influenza.

A. Gregor,⁴⁴ who had previously shown that workers in gas fumes present a certain degree of immunity during an epidemic of influenza, has recently proved by experiments that groups of men can be exposed to nitrogen peroxide and sulphuric acid fumes for lengthened periods during epidemic times without the slightest discomfort or harm. The nasal secretions after exposure to the fumes were found to be acid, and Gregor suggests that the mode of action of NO₂ and SO₂ fumes is to form an acid medium in the secretions of the upper respiratory passages which is inimical to microbial growth.

Iodine Inhalations are discussed as a prophylactic on p. 14.

TREATMENT.—J. B. Herrick⁴⁵ states that the remedy which he found of greatest value was **Digitalis**, given before alarming signs of failing heart developed, and next to digitalis **Opium**, which in the form of $\frac{1}{4}$ gr. of morphia was of special value in the case of constant cough and pleuritic pain.

T. H. Oliver and D. V. Murphy⁴⁶ used intravenous injections of **Hydrogen Peroxide** in 25 cases of influenzal pneumonia, with 13 recoveries and 12 deaths. The anoxæmia was often markedly benefited, and the toxæmia appeared to be overcome in many cases.

Probst⁴⁷ recommends a **Fixation Abscess**, produced by subcutaneous injection of 1 c.c. of turpentine, and ascribes its efficacy to the resultant hyper-

leucocytosis, influenza being associated with pronounced leucopenia. The abscess should not be incised until the temperature has become normal.

Intravenous injections of Hypertonic Glucose Solution were used by Clifford W. Wells and R. C. Blankinship⁴⁸ in 319 cases of influenzal pneumonia. Solutions of 5, 10, 15, and 25 per cent strengths of glucose were used, and thirty to forty minutes were required to inject 250 to 300 c.c. The results were almost immediate, the marked improvement in the pulse suggesting a direct stimulation of the heart muscle.

Serum Treatment.—Good results from intravenous injection of human convalescent serum in influenzal bronchopneumonia are reported by L. W. McGuire and W. R. Redden,⁴⁹ W. R. Redden,⁵⁰ and G. P. Sanborn.⁵¹ From his own observations and the reports of twelve other observers, Redden concludes that when the diagnosis is made early and the treatment correctly carried out, the course of the disease is decidedly shortened, and the death-rate reduced by at least a half and even by three-quarters in any large series in hospital practice.

Vaccine Treatment.—J. Black-Milne and K. Rogers⁵² treated 35 cases of influenzal bronchopneumonia or pneumonia with the Army mixed vaccine. The dosage used at first was 3 min. (and later 5 min.) for the first dose, and 5 min. (and later 8 min.) for the second dose. In the majority of cases improvement took place in the general condition. No bad effects were observed.

Intramuscular injection of an autovaccine is recommended by K. Baerthlein and E. Thoma.⁵³

REFERENCES.—¹*Brit. Med. Jour.* 1920, ii, 211; ²*Amer. Jour. Med. Sci.* 1919, ii, 370; ³*Munch. med. Woch.* 1919, 960; ⁴*Med. Science*, 1920, ii, 418; ⁵*Jour. Amer. Med. Assoc.* 1920, ii, 202; ⁶*Ibid.* 1920, i, 170; ⁷*Amer. Jour. Med. Sci.* 1920, i, 435; ⁸*N. Y. Med. Jour.* 1919, ii, 789; ⁹*Amer. Jour. Med. Sci.* 1919, ii, 577; ¹⁰*Med. Science*, 1920, ii, 421; ¹¹*Ibid.* 114; ¹²*Presse méd.* 1920, 43; ¹³*Jour. Amer. Med. Assoc.* 1919, ii, 633; ¹⁴*Policlínico* (Séz. med.), 1919, 321; ¹⁵*Med. Science*, 1920, ii, 117; ¹⁶*Ibid.* 422; ¹⁷*Brit. Med. Jour.* 1919, ii, 344; ¹⁸*Med. Klinik*, 1919, 977; ¹⁹*Deut. med. Woch.* 1919, 1038; ²⁰*Wien. klin. Woch.* 1920, 291; ²¹*Boston Med. and Surg. Jour.* 1920, i, 194; ²²*Jour. Amer. Med. Assoc.* 1919, ii, 1767; ²³*Arch. of Internal Med.* 1919, ii, 633; ²⁴*Lancet*, 1919, ii, 733; ²⁵*Surg. Gynecol. and Obst.* 1920, i, 357; ²⁶*Amer. Jour. Med. Sci.* 1920, i, 417; ²⁷*Lancet*, 1920, i, 481; ²⁸*Jour. Amer. Med. Assoc.* 1919, ii, 1053; ²⁹*Med. Science*, 1920, ii, 425; ³⁰*Surg. Gynecol. and Obst.* 1920, i, 138; ³¹*Med. Science*, 1919, i, 253; ³²*Ibid.* 146; ³³*Munch. med. Woch.* 1919, 1140; ³⁴*Med. Science*, 1920, ii, 425; ³⁵*Ibid.*; ³⁶*Munch. med. Woch.* 1919, 1321; ³⁷*Ibid.* 1261; ³⁸*Jour. Amer. Med. Assoc.* 1920, i, 986; ³⁹*Surg. Gynecol. and Obst.* 1920, i, 55; ⁴⁰*N. Y. Med. Jour.* 1919, ii, 401; ⁴¹*Med. Science*, 1920, ii, 429; ⁴²*Lancet*, 1920, i, 366; ⁴³*Med. Record*, 1919, ii, 624; ⁴⁴*Brit. Med. Jour.* 1919, ii, 623; ⁴⁵*Jour. Amer. Med. Assoc.* 1919, ii, 412; ⁴⁶*Lancet*, 1920, i, 432; ⁴⁷*Med. Science*, 1920, ii, 430; ⁴⁸*Jour. Amer. Med. Assoc.* 1920, i, 75; ⁴⁹*Ibid.* 1919, i, 709; ⁵⁰*Boston Med. and Surg. Jour.* 1919, ii, 688; ⁵¹*Ibid.* 1920, ii, 177; ⁵²*Lancet*, 1919, ii, 731; ⁵³*Munch. med. Woch.* 1920, 563.

INTESTINAL OBSTRUCTION IN INFANTS. (See CHILDREN, GASTRO-INTESTINAL DISORDERS IN.)

INTESTINAL TOXÆMIA.

Robert Hutchison, M.D., F.R.C.P.

Although much—too much—has been written on this subject, little has been said about the actual chemical nature of the poisons which are believed to be absorbed from the intestine. Graham Brown¹ has studied one of these—para-hydroxy-phenyl-ethylamine—one of the amines which results from the putrefactive destruction of proteins or amino-acids under the action of the anaerobic bacteria favoured by the existence of ileal stasis.

This toxic amine is derived from tyrosine, and is conveyed from the ileum to the liver, there to be converted into *p*-hydroxy-phenyl-acetic acid, in which form it is ultimately excreted in the urine. In suitable cases of intestinal

toxæmia its presence in the urine can be identified and its clinical effects observed with fair accuracy.

It is found that this amine has a pressor effect equal to about one-twentieth that of adrenalin. It exerts its effect through the sympathetic neurones.

If now, the author points out, in a case of chronic ileal stasis and intestinal toxæmia, this pressor toxin, *p*-hydroxy-phenyl-ethylamine, has been formed continuously, though perhaps in small quantity, and as continuously absorbed, it is clear that the patient must have been exposed to the effects of a blood-pressure constantly above normal. The results which we know are apt to follow any sustained high pressure are those we should expect to meet with in such a patient. Prominent among these are arteriosclerosis and chronic interstitial nephritis.

The author conceives that the clinical action of the amine, in small but continuous absorption over long periods, as in a case of intestinal toxæmia, would be as follows: "Hypertonus of the sympathetic would result, rendering these neurones more susceptible to those stimuli—fright, etc.—to which they normally react, and to which, in such a case, they would react in quite abnormal measure. There would then occur a certain rise of blood-pressure and an increase in the pulse-rate. The adrenal glands would be stimulated; the thyroid also, for its innervation is entirely sympathetic. Moreover, increased thyroid activity would in its turn stimulate the secretion of adrenalin".

The subject of sympathetic hypertonus will present some at least of the following characteristics: Spare of build, light of weight, generally of fair complexion, with refined and mobile features, eyes rather prominent and pupils large, the patient will be nervous in manner, with heightened reflexes and some tremor, especially of the eyelids. The action of the heart will be easily accelerated by any excitement, such as that of examination. The blood-picture will show few, if any, eosinophils, there will be a rather high mononuclear count, and the blood-pressure will be above normal. As regards metabolism, the threshold for sugar will be lowered, and glycosuria may follow the diagnostic administration of adrenalin. The secretion of gastric juice will be scanty, with consequent hypochlorhydria, and *x*-ray examination will usually reveal atony of the gastric wall, some tonicities of the sphincters, slow passage of bismuth, and ileal stasis.

In a suspected case the urine should be examined for the amine by the following method: Of the urine (diluted if necessary to specific gravity of 1015), 50 c.c. is taken, and to this 5 c.c. of a 25 per cent sulphuric acid is added. Extract with 15 c.c. of ether. The ether is then evaporated, and 2 c.c. of distilled water and a similar quantity of Millon's reagent added. This is repeatedly boiled and allowed to stand. According to the amount of the amine present, the fluid becomes rose-red, dark-red, or even a deep mahogany-brown. It is to be noted that normal urine gives a red reaction with Millon, but the substances which so act are insoluble in ether. If this reaction is obtained, it may safely be concluded that the case is one of intestinal toxæmia, and that *p*-hydroxy-phenyl-ethylamine is acting selectively on the sympathetic neurones.

In order to limit the formation of the amine, the Diet should consist chiefly of milk, farinaceous foods, fruit, and vegetables. Laxatives are required to prevent stagnation, and Intestinal Antiseptics to lessen putrefaction. Thymol in 5- to 10-gr. doses twice daily is the best antiseptic. Grey Powder and Beta-Naphthol are also useful. In some cases an Autogenous Vaccine prepared from the fæces is serviceable.

REFERENCE.—¹*Edin. Med. Jour.* 1920, Feb., 71.

INTESTINES, SURGERY OF. (See also HERNIA.)

E. Wyllys Andrews, A.M., M.D., F.A.C.S.

Intestinal Obstruction.—Richardson¹ has studied a series of 118 cases operated on for acute intestinal obstruction at the Massachusetts General Hospital from 1908 to 1917 inclusive, and compares the results with a similar series ten years earlier. The mortality dropped from 60 to 41 per cent :—

Type of Cases	1898-1907. C. L. SCUDDER				1908-1917			
	Cases	R.	D.	Mortality per cent	Cases	R.	D.	Mortality per cent
Early post-operative obstruction (first 4 weeks after operation)	18	5	13	72.2	29	22	7	24.1
Late post-operative obstruction (developing after 4 weeks) ..	19	13	6	31.6	28	17	11	39.3
Bands and adhesions without previous operation ..	33	15	18	54.5	14	7	7	50.0
Meckel's diverticulum ..	9	2	7	77.7	4	2	2	50.0
Volvulus ..	9	0	9	100.0	16	12	4	25.0
Intussusception ..	27	13	14	51.8	20	8	12	60.0
Mesenteric thrombosis ..	1	0	1	100.0	5	1	4	80.0
Congenital anomalies ..	2	0	2	100.0	—	—	—	—
Stone in gut ..	1	0	1	100.0	1	0	1	100.0
Internal hernia ..	2	0	2	100.0	1	0	1	100.0
Total ..	121	48	73	60.4	118	69	49	41.5

The drop can be accounted for partly on the ground of earlier diagnosis. This will be noted especially in the first group, early post-operative obstruction. Experience has taught us to distinguish this post-operative complication from other causes of acute pain. In the volvulus series the same is true, as in the later group resection was necessary in only two cases. However, the average time before operation in the whole later series of cases was three days, and until this is reduced we cannot expect a much lower mortality. In the later group jejunostomy was done in a number of cases, and this may be another reason for the lower mortality. In another paper² Richardson discusses this procedure, and reports five cases in which it was done successfully where there was apparently little hope for recovery. He says that the drainage of the upper intestine thus secured can be obtained in no other way. The extremely toxic substances elaborated in the duodenum may be the cause of death even after the obstruction has been relieved, and therefore a jejunostomy should be done in all late cases. They usually close spontaneously in about two months.

Summers,³ in discussing the same subject, expresses very much the same idea, and insists upon draining the fluid-containing portion of the intestine—that is, above the region of the gaseous distention just proximal to the obstruction. His conclusions are as follows :—

1. Teachers of medicine and surgery should impress by personal acts the philosophy of early diagnosis and prompt surgical treatment.

2. A safe two- or three-stage operation is preferable to any radical procedure which would add much risk as a completed operation.

3. When vomiting has reached the stage of being foul, fecal smelling, always drain the small bowel as high up in the jejunum as it is recognizable. Nature points out this route.

4. Anæsthesia should be local—plus gas-oxygen if necessary.

5. Post-operative. Opium should be administered after the Alonzo Clark

formula. Large quantities of normal salt solution should be given by hypodermoclysis. Sodium bicarbonate and glucose in 5 per cent solutions should be administered by the Murphy drip method. Under this treatment the skin will be active if kept warm, and reaction from shock and toxæmia favoured.

Diverticulitis.—Telling⁴ believes diverticula are the result of intrasigmoid pressure, and especially flatulent distention of a colon already weakened by age and fatty infiltration. Willey⁵ does not agree with this view, and says

many cases have a history of diarrhoea and not constipation. He suggests that they may be due to an acute suppuration and sloughing of the lymphoid follicles of the sigmoid, with consequent weakening of the bowel-wall. He also mentions two cases which gave a history of ischiorectal abscess shortly before the onset of the diverticulitis.

The greatest difficulty in the diagnosis is in the differentiation from cancer of the sigmoid. The long proctoscope is of little use, as the area involved is usually just out of reach by this instrument. Telling gives the following differential points in diverticulitis. The absence of cachexia is important. There is usually a tendency to obesity, a long history of attacks of pain in the left lower quadrant, and often of tumour formation with subsequent disappearance. Blood is absent from the stools, at least macroscopically. Vesicorectal fistulæ are of frequent occurrence. Fever and leucocytosis are present during the acute attacks. Radiographs of the colon after a barium enema show a characteristic appearance. Hernaman - Johnson⁶ says that the small masses of

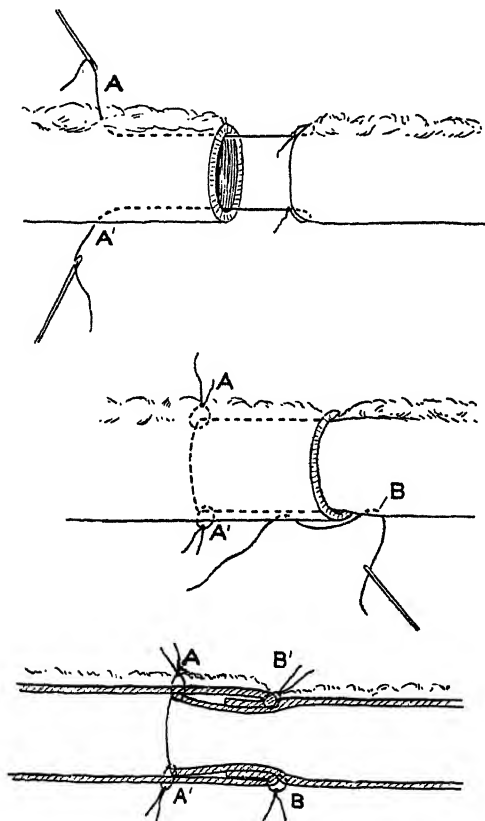


Fig. 38.—Ricketts' method of intestinal anastomosis by invagination. The three stages are shown. A, Anchor threads for invagination; B, Suture to make cuff.

barium left in the diverticula are diagnostic. The colon should be thoroughly cleansed first, and atropine administered to be sure the field is clean. If these precautions are taken, it is always possible to demonstrate the diverticula radiologically (*Plates XXII, XXIII*).

The small acquired diverticula above discussed must be distinguished from those of the congenital type, which often reach a very large size. In the case reported by Wright,⁷ the mass was entirely retroperitoneal, and one of the tænia in the sigmoid could be traced into the diverticulum. Keith⁸ believes

PLATE XXII.

DIVERTICULITIS

(HERNAMAN-JOHNSON)



Fig. 1.—Opaque enema *in situ*. Shows diverticula, but no better than with the meal.

By kind permission of the 'British Journal of Surgery'

PLATE XXIII.

DIVERTICULITIS—*continued*



Fig. B.—The same patient as in *Fig. A*. After evacuation of enema. Numerous diverticula are shown.
(This plate was much under-exposed, but fortunately its diagnostic value is not lessened.)

that this condition arises from a splitting or reduplication of the *anlage* for the hind-gut. The case reported by Straub⁹ probably falls under the same category, although it was thought by him to be acquired. It was a large diverticulum which caused pressure on the ureter and hydronephrosis. The pouch in these cases usually has a definite muscular covering, derived from the muscularis of the bowel, whereas the smaller acquired ones consist only of peritoneum, muscularis mucosæ, and mucosa.

Intestinal Anastomosis.—

In making anastomoses of the large bowel, the value of invagination is being emphasized. Cruder and less anatomical methods, which rely more on deep invagination than on accurate layer-by-layer suture, are being adopted. Ricketts¹⁰ recommends a method of drawing one end an inch or more into the other by sutures as shown in Fig. 38. He says that interrupted stitches of silk or linen should be used for all the layers, as the whole suture line eventually sloughs into the bowel. This fact is used also as an argument against the anatomic or layer-by-layer method, which takes more time and does not heal by layers.

Balfour,¹¹ in discussing the use of the rubber tube in colonic surgery, suggests that if the tube is sewed on to the upper segment, traction on it will help to invaginate the suture line, and another row can be made to cover up the first line (Fig. 39).

Test for Viability of Intestine.—

Hedri¹² speaks of the difficulty at times of deciding on the viability of a segment of colon. There is one sure test, which he has used for many years, and it has never failed him. He cuts off one of the appendices epiploicæ; if the stump bleeds, it can be regarded as a sure indication that the bowel is viable.

REFERENCES.—¹*Boston Med. and Surg. Jour.* 1920, Sept. 2, 288; ²*Ibid.* April 8, 362; ³*Ann. of Surg.* 1920, Aug., 201; ⁴*Lancet*, 1920, i, 85; ⁵*Brit. Med. Jour.* 1920, May 8, 681; ⁶*Lancet*, 1920, i, 199; ⁷*Ibid.* 385; ⁸*Ibid.*; ⁹*Surg. Gynecol. and Obst.* 1920, April, 359; ¹⁰*Trans. Western Surg. and Gyn. Assoc.* 1919; ¹¹*Surg. Gynecol. and Obst.* 1920, Aug., 184; ¹²*Centralbl. f. Chir.* 1920, Aug. 10, 352.

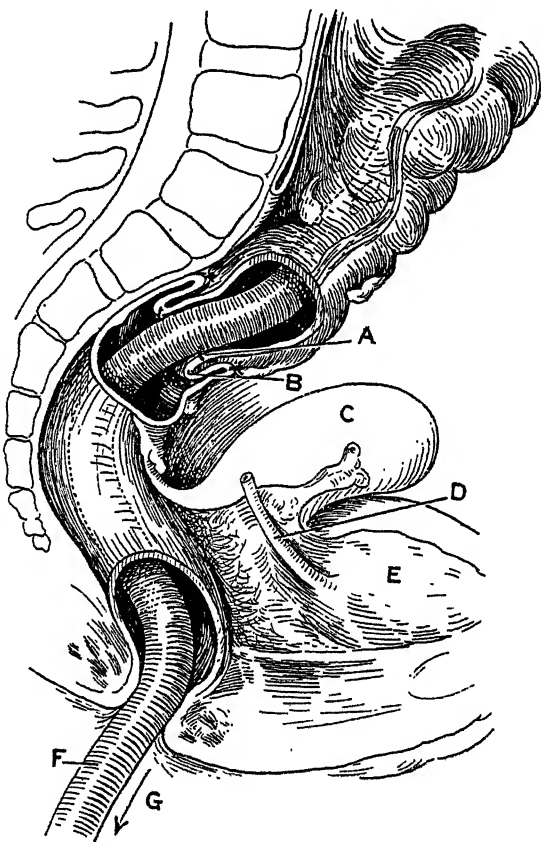


Fig. 39.—The use of the rubber tube in colonic surgery (Balfour). Diagram showing the final relationship of the bowel and rubber tube. A, Suture in rectal tube and sigmoid; B, Invaginated suture line; C, Uterus; D, Ureter; E, Bladder; F, Rectal tube; G, Direction of pull to invaginate suture line.

INTRAVENOUS INJECTIONS IN INFANCY. (*See* INFANCY, INTRAVENOUS INJECTIONS IN.)**IRRITABLE HEART.** (*See* HEART, IRRITABLE.)**JAUNDICE, HÆMORRHAGIC.***Herbert French, M.D., F.R.C.P.*

A peculiar type of acute hæmorrhagic jaundice, apparently of toxic origin, of epidemic nature and high mortality, is described by Douglas Symmers,¹ who draws attention to the possibilities of similar cases elsewhere. Broadly speaking, the clinical and post-mortem features of each case might best be described as strikingly similar to those of spirochætosis icterohæmorrhagica, combined with acute yellow atrophy of the liver, but no spirochætes were discovered in spite of extensive investigations, including guinea-pig inoculations with fresh blood and with urine from eight separate individuals affected by the disease.

There were altogether 16 cases in the epidemic, and the post-mortem findings are recorded in 6 of them. In addition to jaundice and hæmorrhages in the skin, mucous and serous membranes, and various viscera, the kidneys showed either cloudy swelling or acute necrosis of the tubular epithelium, whilst the changes in the liver varied from intense granular degeneration to those commonly described as acute yellow atrophy. The mucosa of the gastro-intestinal tract was greatly swollen and of a dirty yellowish-blue colour in some of the cases, but in others these gastro-intestinal appearances were not present. The possibility of some chemical poison, such as phosphorus, being at the root of the trouble was borne in mind, but none of the investigations carried out from this point of view led to the discovery of any phosphorus substance, and the general conclusion came to was that this epidemic of fatal jaundice was due to some new and hitherto undescribed infection, absorbed apparently from the alimentary canal. Hæmorrhages, either spontaneous or readily produced, were a remarkable feature of practically all the cases.

The clinical symptoms were divisible into two groups. The first was characterized by jaundice of the conjunctivæ, preceded as a rule by lassitude, digestive disturbances, and by physical signs indicative of bronchitis. The patient took to his bed, and in the course of the next few days the jaundice became generalized and intense, often reaching a greenish-yellow after the initial bright saffron colour. Hæmorrhages were constant—epistaxis, hæmatemesis, melæna, hæmorrhagic vesicles about the lips and chin like the purpuric herpes of spirochætosis icterohæmorrhagica, and petechial or splotch-like extravasations of blood beneath the skin or visible mucous membranes, in the former situations corresponding frequently to scratch marks, pressure of bedclothes, or other trivial injuries. By this time the mental condition of the patient attracted much notice. He was languid, drowsy, stuporous, or irritable and restless, sometimes irrational. The stools were clay-coloured. Vomiting and diarrhœa occurred, but were not common. In the majority of cases the patients complained of pain in various localities, and, even though stupor was pronounced, tenderness was easily elicited by pressure on different parts of the body. In two cases the combination of jaundice, clay-coloured stools, vomiting, and epigastric pain with tenderness, seemed to point to mechanical obstruction in the bile-ducts, and the abdomen was opened, but no objective cause for the condition was found. The temperature, pulse, and respiration-rate were variable, depending much upon intercurrent conditions, such as bronchitis. Moderate leucocytosis was the rule, from 11,000 to 24,000 per c.mm., with a normal differential count. The urine contained bile, albumin, and granular casts in abundance.

The second group was characterized by severe jaundice, slight delirium, and rapid death; in such cases the liver presented extensive diffuse necrosis microscopically, although to the naked eye the organ did not seem much damaged.

In most cases the general impression as the cases progressed would be that they were examples of spirochaetosis icterohæmorrhagica, and yet the negative reaction of guinea-pigs to inoculation of the patients' blood or urine suggests to Symmers that the cases he saw during this epidemic were examples of a new variety of acute fatal hæmorrhagic jaundice which merits further investigation should epidemics similar to the one he himself saw occur elsewhere.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1920, April 24, 1153.

JAUNDICE, INFECTIVE.

J. D. Rolleston, M.D.

ETIOLOGY.—P. Uhlenhuth and M. Zuelzer¹ examined 89 wild rats obtained from different districts of Berlin, and found the *Spirochaeta icterohæmorrhagica*, which was pathogenic to mice and guinea-pigs, in the kidneys or urine in 9 cases, or about 10 per cent. They think that as these spirochaetes readily escape detection, the percentage of carriers is probably greater. The rats in question did not present any symptoms during life, and in only two cases were any abnormal signs found post mortem—viz., hæmorrhages in the lungs—so that the disease in rats appears usually to have a latent course.

SYMPTOMS.—According to Pagniez,² the form of spirochaetosis icterohæmorrhagica seen in France is not characterized by the profuse hæmorrhages which occur in Japan, so that he suggests the term 'spirochaetosis icterigenes' as a more suitable one. Out of 43 cases seen by him, epistaxis occurred in 22, but in only 6 was it at all severe. The other hæmorrhages observed were hæmorrhagic herpes in two cases, and slight intestinal hæmorrhage, hæmoptysis, and bleeding from the gums in one case each. The hæmorrhages were associated with important changes in the blood—viz., prolongation of coagulation time, irretractility of the clot, and a considerable but temporary diminution in the number of the blood-platelets.

Although comparatively few cases of spirochaetosis icterohæmorrhagica have been published since the end of the war, Garnier and Reilly³ maintain that cases of acute primary jaundice which are really examples of this condition are far from exceptional in peace time, and point out that the frequency of the disease during the war was due to the prolonged stay of the troops in trenches swarming with rats, which form the reservoir of the virus. They report a case in a man, age 19, who developed a scarlatiniform rash in the stage preceding the appearance of the jaundice. The patient had been sent to a fever hospital as a case of scarlet fever, but this diagnosis was excluded by the absence of sore throat and subsequent desquamation. The diagnosis of spirochaetosis icterohæmorrhagica was confirmed by the presence in the urine of spirochaetes which were pathogenic to guinea-pigs. The writers suggest that some of the recorded cases of jaundice in scarlet fever were really examples of spirochaetosis icterohæmorrhagica complicated by erythema scarlatiniforme.

Sir John Rose Bradford⁴ emphasizes the frequency of pulmonary lesions and pulmonary complications, especially areas of lobular pneumonia, with the expectoration of a sanguinolent sputum. On post-mortem examination, areas of imperfect consolidation together with extreme congestion and hæmorrhagic infiltration are found, and are very characteristic features of the morbid anatomy of the disease.

DIAGNOSIS.—P. Menetrier and A. Durand,⁵ who report two cases of mild spirochaetosis icterohæmorrhagica which occurred in two different districts of Paris in March, 1920, point out that the characteristic features of spirochaetosis

icterohæmorrhagica which distinguish mild forms of the disease from ordinary infective jaundice are the frequency of slight hæmorrhages, especially epistaxis, the intensity of muscular pains, which are sometimes severe enough to simulate meningitis, normal coloration of the stools, and fall of temperature when the jaundice is most pronounced. The diagnosis can be confirmed by examination of the blood and urine for spirochætes, and inoculation of animals.

TREATMENT.—Intravenous injection of Urotropine, which acts as a gastro-intestinal, hepatic, and urinary disinfectant in spirochætosus icterohæmorrhagica, is recommended by A. Da Matta,⁶ 2 grms. dissolved in 15 to 30 c.c. of distilled water being used as a daily dose.

REFERENCES.—¹*Med. Klíník*, 1919, 1301; ²*Ann. de Méd.*, 1919, 63; ³*Bull. Soc. méd. Hôp. de Paris*, 1919, 1128; ⁴*Lancet*, 1920, ii, 583; ⁵*Bull. Soc. méd. Hôp. de Paris*, 1920, 1063; ⁶*Bull. Soc. de Pathol. exotique*, 1919, 128.

JAW, FRACTURES OF.

Soule¹ recommends the treatment of ununited fractures of the lower jaw by bone-pin grafts. He states that simple fractures of the lower jaw with no loss of bone substance are easily controlled by dental splints, but that ununited fractures often need the application of bone inlay grafts. These necessitate a wide dissection of soft tissue. Soule's method consists in drilling along the lower border of the fractured fragments from before backwards with a motor drill, beginning and ending well away from the fracture itself. The fragments are exposed through a skin incision below and along the ramus of the jaw, the posterior fragment is held in alinement with the anterior fragment by an assistant, and the drill is disengaged from the motor and left *in situ*

Sir W. I. de C. Wheeler, F.R.C.S.I.

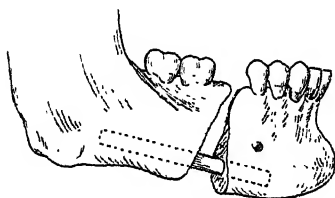


Fig. 40.—Autogenous dowel graft inserted in ununited fracture of jaw.

while a section of cortical bone is being removed from the tibia. The bone-graft is turned in the motor-driven dowel to correspond to the diameter of the drill, the drill is removed from the bone, and the bone-pin is hammered into place. Two pins can be inserted if necessary. [The reviewer has made similar pins from beef and mutton bone in order to hold fractures of the lower end of the tibia in position. —W. I. de C. W.] Fig. 40 shows the autogenous dowel in position. There was firm union in this case when examined eight months after operation.

C. W. Waldron and Risdon² think that dental splints with interlocking devices should be fitted to the teeth at least one week before the operation. Rectal oil-ether anæsthesia is suggested. The authors prefer a graft obtained from the iliac crest.

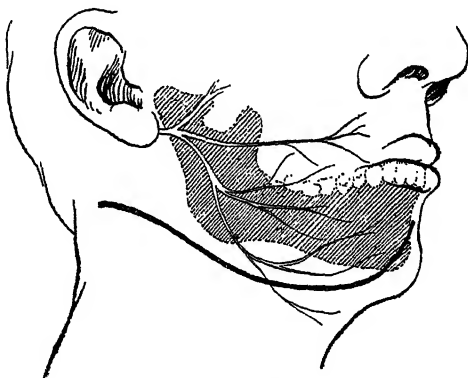


Fig. 41.—Incision in cases of fractured jaw.

Chubb³ recommends the graft to be taken from the crest of the ilium. The size of the graft is practically unlimited, and the general curvature can be suited to each particular case. Bone taken from this situation leaves no post-operative disability. The aim has been in every case to obtain a sound carpenter's junction between the graft and the jaw fragments. The ends of the graft are placed in accurate apposition and wired firmly to the freshened fragments of the mandible. Firm union is obtained in successful cases by the end of three or four months. Pre-operative treatment is a *sine qua non*; sepsis must be eliminated, and bad teeth extracted two or three months before any major operative interference. The use of gouge forceps is recommended in preference to all saws for the removal of sclerosed and doubtful bone. Fig. 41 shows the incision designed to avoid the facial nerve and its branches. The incision is varied to suit individual cases.

[For this work it is necessary to be provided with an Albee's electrically-driven saw. The night before operation a suitable bone is obtained from the kitchen and a graft cut with the twin saw. A bone peg can be rapidly fashioned from the graft with the instrument supplied for the purpose. The drill corresponding to the size of the peg is used at operation, and in a suitable case the fragments in any fracture can be secured rapidly and firmly in proper alinement. The bone must, of course, be thoroughly sterilized.—W. I. de C. W.]

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1920, Sept., 298; ²*Ibid.* 175 (abstr.); ³*Lancet*, 1920, ii, 9.

JEJUNAL ULCER. (See STOMACH, SURGERY OF.)

JOINTS, PAINFUL. Colloidal Sulphur in treatment of (*p.* 10).

KALA-AZAR.

Sir Leonard Rogers, M.D., F.R.S.

C. A. Sprawson¹ discusses the vexed question as to whether kala-azar is indigenous in Mesopotamia, and, believing in a very long incubation period of the disease, he considers the evidence of its occurrence is negative.

ANTIMONY TREATMENT.—Further reports have been published showing the value of Antimony preparations in kala-azar, and some new modifications of the drug have been tried. J. Dodds Price^{2, 3} records a number of cases of kala-azar in Europeans, most of whom did badly up to recently, but he is now able to record an early case which cleared up rapidly on sodium antimony tartrate as recommended by Rogers. He has also used this drug extensively in natives in Assam, and found it to be distinctly less toxic and better borne than the potassium salt, tartar emetic. He has now given over 3000 intravenous injections in kala-azar, and watched the results of double that number given by his assistants in the Nowgong district dispensaries, and is convinced that the sodium salt is the means of curing the vast majority of cases of this disease, and is especially rapid in its action in early cases. Freshly-made solutions should always be used, the maximum dose being $1\frac{1}{2}$ gr. in 10 c.c., and the initial dose 4 c.c. of the same solution, and continued for some time after the parasites are apparently destroyed, as shown by no febrile reactions following a dose. S. S. Kundu^{4, 5} also records a long experience of antimony tartrate in kala-azar in the Nowgong district of Assam. Of 50 out-door cases receiving from eleven to twenty-five injections, 48 were cured and 2 relieved. Of 100 indoor patients, many in very advanced stages, while only 40 received over ten injections, 47 were cured and 15 died. The sodium salt made clearer and more stable solutions. Two to three months generally sufficed for a cure, eighteen to twenty-five injections being required. The treatment has now become very popular on account of the good results achieved. He has verified

most of his indoor cases by spleen puncture without any mischief resulting. U. N. Bramachari⁶ has used a hyperacid antimonyl tartrate (urethane) intramuscularly in kala-azar—which is not very painful on injection in aqueous solution in a strength of 2 per cent, the dose being $2\frac{1}{2}$ c.c.—and reports four cases in which great improvement, including a marked rise in the leucocytes, has resulted. P. Manson-Bahr⁷ records a case of kala-azar treated in London with an improved form of the acetyl-*p*-aminophenyl-stibiate of sodium, first successfully used in this disease by Caronia in Palermo. The new preparation is prepared by Allen & Hanbury under the more simple name of stibenyl, and contains 34.3 per cent of antimony. It is far less toxic than the tartrates of antimony, and it was given intravenously in doses gradually increased from 0.1 grm. to a maximum of 0.6 grm., no untoward symptom being seen except slight collapse after the second dose. The temperature fell to normal in fourteen days, and was keeping down when the case was reported. J. Dodds Price⁸ remarks on this case that the fever of kala-azar, even when not of recent origin, often ceases just as quickly under sodium antimony tartrate treatment.

Cutaneous Leishmaniasis.—D. J. Harries⁹ writes on Baghdad boil, and after describing its well-known characters, advises complete Excision, even when multiple, as the most rapid and satisfactory treatment, healing by first intention being easily obtainable. W. Macadam⁹ records cases in which this disease showed microscopical changes resembling epithelioma, and illustrates them with drawings (*Plate XXIV*). J. G. Tomkinson¹⁰ records favourable results in Oriental sore from the use of Medium to Hard X-ray Tubes, the irritating soft ray being excluded by an aluminium screen. (*See also DELHI BOIL.*)

REFERENCES.—¹*Brit. Med. Jour.* 1919, ii, 667; ²*Ind. Med. Gaz.* 1920, 87; ³*Brit. Med. Jour.* 1920, ii, 453; ⁴*Ind. Med. Gaz.* 1919, 376; ⁵*Ibid.* 1920, 53; ⁶*Ibid.* 176; ⁷*Lancet*, 1920, ii, 179; ⁸*Ind. Med. Gaz.* 1919, 325; ⁹*Brit. Jour. Surg.* 1920, April, 487; ¹⁰*Brit. Med. Jour.* 1920, ii, 897.

KELOID. (*See also SKIN, GENERAL THERAPEUTICS OF.*)

E. Graham Little, M.D., F.R.C.P.

Rutherford Morison¹ contributes a short paper on a case of keloid occurring in a South African negro (*Plate XXV*), and offers some interesting speculations on the nature of keloid and allied affections like epulis and some fibroses which occur in the stomach and intestines, often as the result of strangulation averted in time to avoid gangrene; in the case recorded, operation was undertaken, with good result at least temporarily.

Pfahler² prefers a combination of surgery and Radium application in large keloids. The rays should be applied from a few days to two weeks before operation, at which the keloid should be excised, cutting closely to its margin. A second full dose of radium is to be given a week after operation, and should be repeated three or four times.

Use of a Pepsin solution advocated (*p.* 17).

REFERENCES.—¹*Brit. Jour. Surg.* 1920, April, 538; ²*Arch. of Dermatol. and Syph.* 1920, Aug., 181.

KERION OF CELSUS.

E. Graham Little, M.D., F.R.C.P.

Rasch¹ supports the suggestion made long ago by Sabouraud that it might be useful to inoculate material from kerion in the treatment of extensive and intractable tinea. The treatment he adopts for kerion is the application of simple compresses of boiled water changed four to six times a day.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* (aistr.) 1920, June 6, 1614.

PLATE XXIV.

CUTANEOUS LEISHMANIASIS RESEMBLING EPITHELIOMA (W. MACADAM)

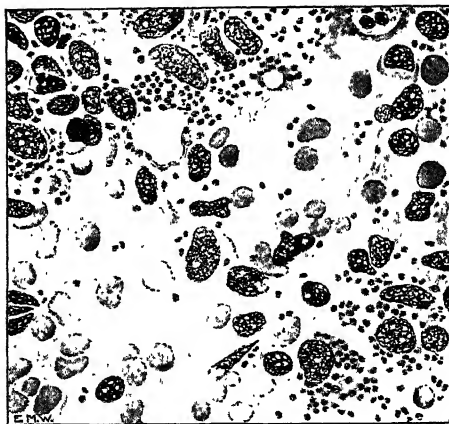


Fig. A.—*Leishmania tropica*. Drawn from smear of granulation-like material of excised ulcer histologically resembling a squamous-celled carcinoma.



Fig. B.—Drawing ($\times 62$) of vertical section of edge of Oriental sore, showing marked epithelial down-growth and extensive cell-nest formation. There is considerable round-celled infiltration, chiefly lymphocytes and large endothelial cells.

PLATE XXV.

AN UNUSUAL CASE OF KELOID



By kind permission of 'The British Journal of Surgery'

KIDNEY FUNCTION TESTS.

John D. Comrie, M.D., F.R.C.P.

The general tendency of late has been towards the simplification of these tests. Of the pigment tests previously recommended, the injection of phenol-sulphonephthalein and determination of the amount excreted in the urine still holds its position in the estimation of most writers on the subject.

MacLean and Russell¹ record a study of the kidney function in cases of nephritis. They point out the fallacy of relying much upon quantitative estimation of albumin in the urine, because in the first place severe forms of kidney disease (interstitial) may show no albuminuria, while albumin may be present in healthy persons—as for example it was shown to be in the urine of nearly 6 per cent of soldiers who had just completed their training (see MEDICAL ANNUAL, 1920, p. 244). For the qualitative estimation of protein in the urine they prefer salicylsulphonic acid (25 per cent in water). They consider the method sometimes practised, of testing the kidney function by administering 10 grms. of salt and estimating the amount excreted in the urine, to be open to grave objections. Many healthy persons retain salt in the tissues, and it may be that only after a prolonged administration is equilibrium established and regular excretion of the surplus salt carried out by the kidneys. For the differentiation of interstitial and parenchymatous nephritis, and for estimation of the seriousness of kidney involvement, they consider three procedures the most useful for clinical purposes. These are: (1) Estimation of blood-urea; (2) The urea-concentration test in urine; (3) The diastatic activity of the blood. (See also NEPHRITIS).

1. *The estimation of blood-urea* is carried out by a process recommended some years ago by Marshall and Van Slyke, as modified by MacLean and de Wesselow.² The concentration of blood-urea is an indication of the efficiency of the kidneys, because the worse the renal lesion is, the higher will be the blood-urea. The principle of the method depends on the fact that soya bean contains a specific enzyme (urease), which converts urea into ammonium carbonate, but has no effect on any other nitrogenous constituent. In the presence of alkali, the ammonia is liberated from the ammonium carbonate. By the help of a current of air (drawn by an air-pump through the tube in which 3 c.c. of blood is mixed with 0.3 gm. of powdered soya bean) the ammonia is passed through another tube containing 25 c.c. of $\frac{N}{100}$ acid. The acid is thereafter neutralized by $\frac{N}{100}$ sodium hydroxide until the indicator (methyl-red) gives a faint yellow colour. The difference between the 25 c.c. of acid originally taken and the number of c.c. of alkali used gives the number of c.c. neutralized by the ammonia evolved. Each c.c. of acid neutralized corresponds to 10 mgrms. of urea. In severe cases of interstitial nephritis the blood-urea may rise from the normal 25 mgrms. per 100 c.c. to 200 or 300 mgrms. per 100 c.c. of blood. (See also NEPHRITIS.)

2. *The urea concentration test* was introduced by MacLean and de Wesselow.³ It depends upon the fact that patients with defective kidneys are incapable of secreting urine with a high concentration of urea; and the degree of concentration of urea in the urine appears to be directly proportional to the functional power of the kidneys. If a dose of 15 grms. of urea in 100 c.c. of water be given by the mouth to a normal person, the urine passed in the next hour or two should contain 2 to 4 per cent of urea. In patients suffering from nephritis the percentage is less, and the lower the percentage the more serious is the kidney lesion. The patient empties his bladder one hour and two hours after taking the dose of urea, and a 4-c.c. sample from the latter is tested by the ordinary method of decomposing the urea with sodium hypobromite, and measuring the volume of nitrogen evolved. Eight cubic centimetres of nitrogen gas is the equivalent of 0.5 per cent of urea.

3 *The diastase test*¹ depends on the normal presence of pancreatic diastase in the urine. When the kidneys are efficient a constant amount of this ferment (6 to 30 units) is excreted in the urine. With defective kidneys the amount is lower in proportion to the renal inefficiency. The diastatic activity of a specimen of 24-hours urine is estimated in terms of the amount of urine which will destroy a given quantity of starch in half an hour. The disappearance of the starch is indicated by the failure of the mixture of starch and urine to give a blue colour with iodine. The test is very simply carried out with the help of a water-bath at 37° C.

Upham and Higley¹ have endeavoured to arrive at an estimation of the renal efficiency by estimating the *power of the kidney to concentrate uric acid*. Estimations are made of the uric acid, after a certain standard diet, in the blood and in the urine respectively. For these estimations the method of Benedict and Hitchcock was used. While the normal person has a uric acid percentage in the urine 20 times as great as that of his blood, cases of nephritis show a concentration figure of 14 times or lower. This test for renal efficiency, however, is obviously not simple enough for general clinical use.

Fitz⁵ records an investigation of forty-one cases of nephritis by the phenol-sulphonaphthalein test and by non-protein blood-nitrogen estimation. He found that, as cases progressed in severity, the phenolsulphonaphthalein excretion invariably fell off gradually, while the non-protein nitrogen of the blood rose correspondingly, and he considers that together they are of great value in following the course of a case of chronic nephritis and the results of treatment.

Leathes⁶ points out that in cases of war nephritis examined, two common failures were loss of diuretic response to the intake of water and absence of the ordinary morning alkaline tide. Cottet⁷ draws attention to two other simple indications of functional inefficiency in the kidney—viz.: (1) That while the ratio between the amount of urine by day (9 a.m. to 9 p.m.) and that by night in the normal person is 2 to 1 or 4 to 1, in pathological kidney conditions the relation is 1 to 1, or the night urine may be the greater; (2) That while the specific gravity in normal persons varies greatly in the twenty-four hours (it may be from 1001 to 1025), in chronic nephritis it remains much more constant all the time.

Henes⁸ considers that changes in the amount of cholesterol in the blood are of great importance in the prognosis of chronic nephritis. He gives the detailed examination of numerous cases—one, for example, in which the cholesterinæmia fell in six weeks from 7.97 to 2.49 mgrms. before death. Such a decrease is, he finds, of very bad prognosis.

MacNider⁹ has made an elaborate study of various functional tests in experimental nephritis brought about by poisoning with salts of uranium or mercury. He concludes that injury to the kidney of this nature is indicated first by a reduction in the elimination of phenolsulphonaphthalein, and later by retention of blood-urea and of creatinin; also that the tubular epithelium is of more importance than the glomeruli in maintaining a normal acid-base equilibrium of the blood, and in the elimination of the substances mentioned.

O'Hare¹⁰ records the results of renal efficiency tests (phenolsulphonaphthalein and blood-urea) in twenty-five cases of arterial hypertension from 150 to 250 mm. systolic pressure, showing, however, no clinical signs of renal disease. These demonstrated that little renal impairment was present, thus agreeing with the clinical findings.

Kahn¹¹ has made an examination upon a large number of cases suffering from different types of kidney disease, with the view of verifying the statement made by some writers that the relation of serum albumin to serum globulin in the blood is disturbed in these diseases. In normal subjects the

ratio of serum albumin to serum globulin is approximately 1.5 or 2 of the former to 1 of the latter, and Kahn found that this remains practically unchanged in nephritis, both under ordinary conditions and when the patient is fed on a high protein diet.

REFERENCES.—*Lancet*, 1920, i, 1305; *Quart. Jour. Med.* 1919, Dec., 347; *Brit. Jour. Exper. Pathol.* 1920, Feb., 53; *Arch. of Internal Med.* 1919, Nov., 557; *Boston Med. and Surg. Jour.* 1920, ii, 247; *Brit. Med. Jour.* 1920, i, 403; *Paris méd.* 1920, June, 513 (abstr. in *Jour. Amer. Med. Assoc.* 1920, ii, 705); *Arch. of Internal Med.* 1920, April, 411; *Ibid.* July, 1; *Boston Med. and Surg. Jour.* 1920, i, 345; *Arch. of Internal Med.* 1920, Jan., 112.

KIDNEY, SURGERY OF. (See also URETER.)

J. W. Thomson Walker, M.B., F.R.C.S.

Transplantation of Kidney.—Dederer¹ succeeded in transplanting the left kidney and ovary, together with their blood-supply, from one puppy to the neck of another of the same litter. The kidney and ovary lived for twenty-six days, when the dog died of distemper. On the evening of the transplantation, urine flowed from the urethral orifice, and continued to flow as long as the dog lived. The function of the kidney was tested from time to time, one test being made on the twenty-sixth day after operation, when phenolphthalein appeared $2\frac{1}{2}$ minutes after intravenous injection and was excreted freely. Post mortem the arterial anastomosis was satisfactory, but the venous anastomosis was incomplete.

Ambard's Constant in Renal Surgery.—In testing the function of the kidneys prior to operation, Legueu² uses Ambard's constant. In 437 cases of nephrectomy, 250 were based on the indications given by catheterization, and 187 on those given by Ambard's constant alone. In the former the mortality was 3.2 per cent, and in the latter 4.2 per cent. When the constant is a figure less than 0.1 the disease is unilateral, and nephrectomy can be done safely when it is known which side is diseased. When the figure of the constant is above 0.120 the outlook is much more serious. The higher the constant the greater the danger, especially when it is above 0.140. In cases of serious bilateral infection, catheterization may be of value in determining which kidney is least involved.

Anomalies of Renal Blood-vessels.—Eisendrath,³ after investigating the congenital variations of the renal vessels, concluded that upper polar arteries arise from the main renal vessels in about 1 kidney out of 5, and from the aorta and iliac in 1 kidney out of about 7. Upper polar arteries arising from the main renals occur in about 1 out of 200 kidneys, and upper polar arteries from the aorta in about 1 in 190 kidneys. Lower polar arteries arise from the main renal artery, the aorta, or common iliacs, in about 1 out of 185 kidneys. From his dissections Eisendrath concluded that we must abandon the view that the posterior aspect of the renal pelvis is the avascular field that it is generally believed to be. The author goes on to describe the anomalies he found in the retropelvic arteries and veins. In view of the relative frequency of anomalies in the renal vessels, the author suggests that during nephrectomy and nephrotomy the poles of the kidney should be carefully exposed, care being taken to examine all adhesions.

Resection of Double Kidney.—Herrick⁴ records a case of resection of a double kidney. Two right ureteric orifices were seen on cystoscopy, and pyelography revealed a double renal pelvis, the lower of which showed evidence of dilatation. There had been numerous attacks of renal colic on this side. The lower half of the double kidney was resected and the exposed renal tissue covered with fatty capsule. Four other cases were found in the literature.

Causes of Dilatation of Pelvis and Ureter.—According to Braasch,⁵ dilatation

of the renal pelvis may be caused by mechanical obstruction, infection, and disturbances of innervation. The various types may be recognized by differences in (1) outline of the pyelo-ureterogram, (2) pathology, (3) clinical data.

Continued mechanical obstruction in any position of the urinary tract is necessarily followed by dilatation of the portion above.

Any considerable degree of chronic infection involving the renal pelvis and ureter will be followed by dilatation. The dilatation is not caused by mechanical obstruction, but is the result either of change in the tissues and a consequent retraction in the walls of the pelvis and ureter, or of necrosis. The dilatation may vary from scarcely recognizable irregularity of the calices or dilatation of the ureter to complete destruction of the pelvis. Dilatation of the renal pelvis as the result of inflammatory changes in its walls differs from mechanical dilatation in (1) predominance of dilatation of the calices or ureter rather than of the true pelvis, (2) comparative irregularity of outline. Both inflammatory and mechanical factors may be present with ureteral and pelvic dilatation. Either factor may be the primary cause of the dilatation while the other has a secondary influence.

Dilatation of the ureteral meatus associated with paralysis of the bladder resulting from disease of the nervous system has been described, but this occurs only in a small proportion of cases. The dilatation of the ureter extends to the renal pelvis. It may be due in part to the increased pressure of the urine in a dilated bladder, but may occur without residual urine, and is then probably due to disturbance of the innervation of the ureter.

Another form of dilatation is sometimes found, involving the ureter and pelvis, usually on both sides, without any stricture of the ureter. This is usually regarded as congenital.

Pyelitis, Pyelonephritis.—Magonn⁸ studied the renal pelvis as a possible source of infection of the blood-stream. Burns and Schwartz⁷ found that after injection of indigo-carmin and india-ink particles into the previously ligatured ureter, these substances were found in the opposite kidney and in the liver, lungs, and spleen, and concluded that if particles of ink can travel in this manner, bacteria and other foreign substances can do likewise. Magonn, from his experimental investigation, concluded that bacteria can pass from the kidney into the blood-stream, and that they may do this under conditions analogous to some of the pathogenic states found in man.

Jacobson⁸ describes three cases of *pyelitis*, *ureteritis*, and *cystitis cystica*, and discusses the literature. The condition is, he concludes, a cystic inflammation occurring in 95 per cent of cases in senile arteriosclerotic individuals with a previous history of urinary inflammation. The cysts take origin in the cell-nests of Brun, which result from infolding of the mucosa; an inflammatory irritant, usually from the pelvis or bladder, causes the formation of granulation tissue, which heals over the apposed tips of the folds of mucous membrane. Proliferation of the isolated epithelial cells takes place, and is followed by central degeneration and fluid transudation, giving rise to cysts.

W. Mayo⁹ reviews the literature of *hæmatogenous infection of the kidney*. The cocci, according to the work of Cabot and Crabtree, affect the cortex of the kidney and often follow the lines of least resistance towards the periphery. Colon bacilli affect the straight collecting tubules of the pyramids, extend from them to the pelvis, and there produce pyelitis. Pyogenic infections may lead to cortical abscesses and other changes visible to the naked eye, but, with scanty urinary findings beyond a trace of albumin in the acute stage and a few microscopic pus- and blood-cells, the urinary evidences are so slight as to be overlooked unless great care is exercised. The pyogenic cocci are short-lived, and may not be found in the lesions they have produced. The staphylo-

coccus is short-lived, and often affects only one kidney. Acute streptococcal infections are most malignant. In the chronic form of hæmatogenous nephritis of bacterial origin, small collections of fluid may be found in various stages of sterilization. Occasionally there is a deposit of calcium phosphate in such an infected area, usually close to the capsule, and this throws a shadow with the x rays.

Aschner¹⁰ describes two cases of *unilateral pyelonephritis*, and discusses the treatment of the condition. Recently opinion has swung towards conserving the diseased kidney, and performing decapsulation and nephrotomy. Some authorities recommend nephrotomy for bacillary infections (such as *B. coli* and *B. pyocyaneus*) and nephrectomy for coccus infections (staphylococci and streptococci). The author holds that the treatment must depend on the power of resistance and the margin of safety of renal tissue. Nephrotomy and decapsulation cannot remove the infected foci, and therefore this treatment depends upon the patient's power of resistance. Primary nephrectomy is by far the safer procedure in patients showing evidence of severe septic absorption and of renal insufficiency, and when the condition is of long standing, involving loss of weight and strength.

Perinephric Abscess.—Bergeret,¹¹ after discussing the primary perinephritic suppuration, concludes that it is always secondary to a localized infection. Cellulitis, gastro-enteritis, boils, anthrax, are the most frequent causes. The metastasis occurs by the blood-stream, which almost always affects the kidney, and secondarily the perirenal adipose capsule. Rigidity of the abdominal wall and intense pain in the costovertebral angle are the most important early signs, and the diagnosis is confirmed by the discovery of a unilateral bacilluria or a diminished function of the kidney on one side.

Tuberculosis of the Kidney.—Buerger¹² discusses the subject of ascending renal tuberculosis. He admits that an ascending infection is rare, but believes it occurs in a small proportion of cases. A number of cases recorded in the literature support this view. There are cases where the bladder and ureter are affected, the pelvis of the kidney healthy or tuberculous, but the kidney itself free from tubercle. Three cases are described which, the author holds, show evidence of ascending tuberculosis.

Colston and Waters¹³ discuss the rôle of x rays in the diagnosis of long-standing renal tuberculosis. X-ray examination of the entire urinary tract should be carried out in all cases of suspected renal tuberculosis. In some cases, when other methods of examination have failed, a definite diagnosis of renal tuberculosis can be made from the plain x ray alone, but, whenever possible, catheterization of the other ureter should be done. The shadows depend upon the amount of calcification that has taken place in the diseased kidney. They vary from small indefinite shadows cast by small areas of calcification, to a lobulated shadow of a completely destroyed kidney.

Runeberg¹⁴ found only 33 per cent of his 56 cases of aseptic renal pyuria were due to tuberculosis. In 12.5 per cent calculus was a factor. In blood-borne infections of the renal pelvis, there is, he says, first a very slight glomerulo-nephritis, then elimination of bacteria causes foci in the kidney substance and an elimination pyelitis. On examining the pus in the urine in ten tuberculous and ten non-tuberculous cases of bacterial pyuria, Runeberg found characteristic changes in the leucocytes only in tuberculous cases. The leucocytes showed irregular edges, took stains badly, were polyhedral, and the nuclei might drop out and vacuoles appear.

Braasch¹⁵ discusses cases of renal tuberculosis, and the operative results seen at the Mayo clinic. Renal tuberculosis occurs most frequently between the ages of twenty and forty years (70 per cent), and is twice as frequent in

the male as in the female. In children it is more often a part of general tuberculosis. Tuberculosis was found elsewhere in the body in 71 per cent of cases. Multiple lesions, unless they are a part of an acute general infection, do not necessarily render the prognosis unfavourable. Evidence of healed pulmonary tuberculosis is present in fully one-third of the patients. Active pulmonary tuberculosis was present in 5 per cent, and the mortality of operation in this group was very high (37.5 per cent). The genital organs were affected in 78 per cent of male patients, but this did not affect the ultimate recovery. The frequency of spontaneous healing of the prostate and seminal vesicles contra-indicates their removal by subsequent operation. Tuberculosis of the bones and joints was present in 6 per cent, and one-half of these were active. The late mortality was low (5 per cent). Spondylitis was present in 5.7 per cent, with a mortality of 12 per cent. Tuberculous adenitis was present in 6.4 per cent. The mortality among patients with marked bladder involvement is twice as great as with slight involvement. The degree of involvement is dependent as much on the duration of the symptoms as on the virulence of the infection. The mortality is influenced by the degree of pathological involvement of the kidney, and increases in proportion to the extent of the lesion. Recovery from bladder symptoms is more likely to occur, and takes place earlier, when the operative symptoms are short than when they are long. In cases of bilateral renal tuberculosis, nephrectomy is not followed by permanent improvement or recovery of the remaining kidney. Operative mortality was 1.3 per cent, the late mortality (5 years or less after operation) approximately 20 per cent, failure to effect complete cure 20 per cent.

Magnus¹⁶ records a case of tuberculosis of one-half of a horseshoe kidney. The diseased portion of the horseshoe was removed, and the isthmus, which was 5 cm. broad, was crushed with a clamp.

Taddei¹⁷ states that renal tuberculosis almost always escapes detection during the period when a nephrectomy offers the greatest chance of success. It is a chronic disease and develops insidiously, with periods of remission. The first phase is albuminuria, the second pyuria, and the involvement of the bladder forms the third phase. Usually it is only after some time has been wasted trying to cure the cystitis that the kidney is suspected, just before the fourth phase of bilateral involvement is reached. Every young person with albumin and pus or blood in the urine, not explainable by gonorrhœa or other disease, should be suspected of renal tuberculosis, even although the general condition is good. The urine is cloudy, and there is frequently tenderness over the kidney or ureters. The diagnosis is made by the discovery of the tubercle bacillus. Renal tuberculosis is unilateral in the first stages of its development in 88 per cent of cases.

Forin¹⁸ studied, by means of experiments on animals, the effect in bilateral renal tuberculosis of removing the more advanced of the diseased organs. The removal of one kidney means, he states, an increased blood-supply for the remaining kidney. This and the compensating hypertrophy have a favourable influence on the tuberculous lesion in the remaining kidney. There may be no recession of the lesions, but they tend to remain localized.

Renal and Ureteric Calculi.—Hyman¹⁹ describes four cases where the x rays failed to demonstrate calculi in the urinary tract. He quotes Cabot as stating that renal calculi fail to show with the x rays in 6 to 15 per cent of cases, and Braasch and Moore, Beer and Geraghty as stating that the failure is 15 to 30 per cent in ureteral stone, whereas in vesical stone it is more than 60 per cent (Beer, Hyman). The composition of the calculi in the four cases was chiefly urates of ammonium. Two factors which are the cause of failure are obesity, and the clinical composition of the stone, "It was formerly believed," he

states, "that the majority of renal calculi were composed chiefly of urates and uric acid. These concretions are translucent to the x rays and seldom throw shadows. Recently it has been demonstrated by able chemists (Rosenbloom and Kahn) that the majority of primary renal calculi are composed principally of calcium oxalate salts." [The percentage of failures here stated is far beyond that shown by competent radiographers in this country. It is many years since Morris showed that the majority of primary renal calculi were chiefly composed of calcium oxalate. Stones composed chiefly of ammonium urate are not very frequently found in this country, and the chemical composition would be regarded as a sufficient explanation of the failure to throw an x -ray shadow.—J. W. T. W.].

Braasch and Carman²⁰ describe *renal fluoroscopy at the operating table*. The necessity for this procedure lies in the difficulty sometimes experienced in finding a stone in the kidney, and the possibility of leaving several fragments of stone that have been broken off in removal. The apparatus is essentially the same as that used in the base and field hospitals of the army. Such instruments consist of a transform and autotransform enclosed in a metal cabinet mounted on large castors. To the cabinet is attached a tube-stand with a horizontal arm having universal joints for supporting the tube. The tube is of the Coolidge radiator self-rectifying type, mounted on a lead glass shield. The x -ray operator wears goggles of smoked glass for about fifteen minutes before the observation is to be made, so that he may have the necessary dark accommodation and retinal perception. The x -ray apparatus should be as close to the operating table as possible, and the rays focused through a small diaphragm. When ready for the examination, the hooded screen is placed over the eyes and the goggles are removed. The current is turned on by means of a foot-switch. In the right hand is held a sterilized metal-tipped rod, 18 in. long, with which the stone shadow in the kidney is indicated.

E. L. Young²¹ discusses the question as to how long a stone known to exist in the kidney can be left without serious damage to the kidney. Stones in the ureter are more certain to cause damage to the kidney than stones in the pelvis or calices, and a small stone arrested in the ureter may do as much damage as a large one. Stones in the calices can cause as much damage as stones in the pelvis.

Pus can be present during life without any damage being found post mortem, so that the presence of infection as well as of pus is necessary before important kidney damage is found to be present. The vast majority of renal or ureteral stones do at some time cause obstruction, and always invite infection, and accordingly are sources of danger. There is no arbitrary standard by which we can say that a given renal stone may or may not have to be operated upon; but in any given case without infection or other evidence of kidney damage a calculus may be left alone until it is passed, until pain forces operation, until evidence of infection and damage begin, or until it is shown to be increasing in size so that a pyelography becomes more difficult. In the case of a ureteral stone, if in spite of cystoscopic manipulation it has ceased to make progress, it should be removed after remaining stationary for only a relatively short time, in spite of possible lack of symptoms.

Lett²² discusses the question whether a calculus giving rise to no symptoms should be removed by operation, and concludes that operation should be performed as soon as the calculus is diagnosed, unless it is very small, or the patient's general condition contra-indicates operation. The results of leaving a calculus are interstitial nephritis, hydronephrosis, pyonephrosis, perinephritic abscess, and acute pyelonephritis. Further, 50 per cent of old-standing cases of renal calculus show calculi in the second kidney. The mortality of collected

statistics of operation for stones is too high compared with the results of those of more recent date. The author had 2 deaths in 50 consecutive cases of operation for renal calculus. One of these had a calculous anuria, and the other died of acute colitis. Fourteen cases of ureteric calculus were operated, and all recovered.

Nicolich²³ has performed pyelotomy in 33 cases in 168 operations for renal calculus since 1898. There is danger of hæmorrhage after nephrotomy. In 36 cases of aseptic nephrolithotomy he was obliged to perform nephrectomy in 4 cases of hæmorrhage. Hæmorrhage should never occur after pyelolithotomy if the surgeon performs it when it is really indicated, and if in opening the pelvis the incision is not prolonged too far towards the kidney, where important vessels may be cut. In the author's 33 cases of pyelolithotomy there were 2 cases of hæmorrhage which necessitated nephrectomy, due in each case to prolonging the incision. The renal tissue is not damaged in pyelolithotomy, and Nicolich does not consider there is any danger of fistula after this operation.

Renal Tumours.—Molla²⁴ reports two cases of *myxoma* of the kidney. These tumours are very rare, and cannot be diagnosed before operation. The diagnoses made in the author's cases were hydatid cyst and 'cold abscess'. The absence of urinary symptoms is due to mechanical obstruction without invasion of the ureter. Diffuse metastasis by the blood-stream is very exceptional.

Fraser²⁵ has studied the pathological and clinical features of seven cases of *mixed tumours* in children from five months to six and a quarter years old. The greatest proportion of such tumours occur during the first seven years. The clinical symptoms are an abdominal tumour with the absence of changes in the urine. In only one case was there a single attack of hæmaturia. Cachexia, ascites, and oedema are late symptoms. Stretched over the tumour was a layer of compressed and functionless kidney tissue. The body of the tumour was adenomatous, and in the centre was an area of sarcomatous tissue, while towards the surface at one segment non-striped muscle was found. Fraser believes that the tumour takes origin in the specialized cells of the metanephros or permanent kidney, and that the adenomatous tissue is developed from a mesoblast source. He propounds the theory that the cause of the tumour formation is an imperfect blood-supply of the metanephros. The sarcomatous tissue, he holds, is a metaplasia of the adenomatous tissue.

Primrose²⁶ describes a *squamous-celled carcinoma* of the kidney in a horse-shoe kidney, complicated by calculous pyonephrosis. He concludes, after reviewing the literature, that squamous-cell cancer has its origin in the transitional epithelium of the calices and renal pelvis, with subsequent invasion of the kidney substance. Its development is clearly associated with the production of villous growths which, at first benign, may develop malignancy. In certain instances there may be extensive metaplasia of the transitional epithelium of the calices, pelvis, and ureter. The ureteric process is probably preceded by chronic inflammatory changes produced by some irritant such as stone.

At the 28th French Congress of Surgery²⁷ the subject of *paranephritic tumours* was discussed. Lecène stated that the great majority of these cases were connective-tissue growths, either pure lipoma or sarcoma, or complex tumours such as myxofibrosarcoma. In some cases a true ossification of areas of the growth was observed, which Lecène ascribes to the late development of embryonic bone-forming tissue. Epithelial masses originating probably in the Wolffian body have also been described. The development of the growth is painless and insidious, with little if any sign of pressure until the late stage. In the late stage there is also general debility, and febrile attacks

may be observed. The only sign may be the general enlargement of the abdomen. The tumour is a mutilated mass of variable consistence, but never giving the feeling of a cyst. A pre-operative diagnosis is seldom made. The operation mortality is high (40 per cent), and post-operative recurrence common.

Thévenot described *paranephritic cysts*. These have a wall lined with epithelium or endothelium. These cysts are less common than new growths. They are usually situated on the anterior aspect of the lower pole of the kidney, from which they are almost always separated by a line of cleavage. The ureter escapes compression, and it is not usually necessary to perform nephrectomy. In some cysts there is a communication with the renal pelvis. There is a tendency for the cysts to strip up the peritoneum and lie in contact with the abdominal wall. The author considers these cysts originate in the Wolffian body, or they may be an aberrant renal nodule or a diverticulum of the pelvis. In some cases the origin may be ascribed to the cells of the peritoneum, or to the lymphatics, or to suprarenal rests. As in the solid tumours, the onset is insidious and the progress slow. Pain is a more frequent symptom, and may be aching or radiating in character. Digestive disturbances, cedema of the legs, and general deterioration are present in advanced cases. Urinary symptoms are exceptional. Examination of the abdomen shows a cystic tumour which appears to be fixed to the abdominal wall. The cyst may reach a large size without affecting the neighbouring organs and without forming adhesions. The prognosis is favourable.

Michaelson²⁸ gives the results of his operations for *hypernephroma* in 30 cases: 7 are still in good health after fifteen, twelve, nine, seven, and four years; 6 died of recurrence or metastasis within three years, and 3 others in from four to ten years; all the others died from intercurrent disease, but metastases were probably present in some of them. It is difficult to base the prognosis on the microscopical findings in the tumour. Even those that do not show malignancy under the microscope may develop metastases.

Operative Technique.—Villard²⁹ employs an anterior incision along the outer border of the rectus in operating on the kidney. He selects for the incision cases where the kidney is enlarged so that it can be felt by abdominal palpation alone without the aid of the hand behind the loin. The peritoneum is opened and the tumour exposed. The peritoneum covering the renal growth is incised, extended to the colon, and the colon displaced inwards. A good view of the vascular pedicle is obtained. Villard considers that the risk of infecting the peritoneum in a septic kidney is minimal. Grégoire makes an anterior incision, but instead of opening the peritoneum he turns it inwards from the front of the kidney, carrying the colon with it.

Hofman³⁰ favours an intraperitoneal abdominal incision in renal growths, for the following reasons: The patient is more comfortable lying on the back after the operation. The pararectal incision injures no muscle fibres and can be extended without entering the peritoneum. There is complete exposure of the hilum and of the vena cava, and the vessels are ligatured under the eye. The removal of a diseased ureter can be carried out without difficulty. The stitching of the abdominal wound is easier and produces a smoother scar than the oblique lumbar incision.

Chute³¹ relates his experiences in 20 cases of secondary nephrectomy. He divides cases of secondary nephrectomy into those in which the procedure was planned previous to the original nephrotomy, and those in which it was a second operation to cure a previously unsuccessful interference. The first class is really a two-stage nephrectomy, nephrotomy being the preliminary stage and being performed with the object of removing sepsis before subjecting

the patient to the severe shock of nephrectomy. Several of the cases belonging to the second group were fistulæ following the removal of stones. Chute apparently believes that better results would be obtained if all stones were removed by nephrotomy and none by pyelotomy. Fistula, he holds, is likely to form after pyelolithotomy, and drainage can better be carried out by nephrotomy. Contrary to generally expressed views, he looks upon nephrolithotomy as conservative of kidney tissue compared with pyelolithotomy. He uses an elliptical incision which includes the sinus, and after dissection clamps the sinus to prevent soiling of the wound. He refers to injury to the colon, and has occasionally seen a fæcal fistula follow a difficult secondary nephrectomy, but the fistula has always healed spontaneously. In exceptional cases he has found it necessary to leave clamps in the renal pedicle.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1920, July, 45, and *Jour. Amer. Med. Assoc.* 1919, Dec. 13, 1836; ²*Surg. Gynecol. and Obst.* 1920, Sept., 232 (abstr.); ³*Ann. of Surg.* 1920, June, 726; ⁴*Surg. Gynecol. and Obst.* 1920, June, 56Q; ⁵*Jour. Amer. Med. Assoc.* 1919, Sept. 6, 731; ⁶*Ibid.* 1920, Jan. 10, 73; ⁷*Jour. of Urol.* 1918, Dec., 445; ⁸*Johns Hop. Hosp. Bull.* 1920, April, 122; ⁹*Jour. Amer. Med. Assoc.* 1919, Oct. 4, 1023; ¹⁰*Ibid.* Oct. 11; ¹¹*Presse méd.* 1919, Oct. 4, 563; ¹²*Amer. Jour. Med. Sci.* 1919, Oct., 482; ¹³*Johns Hop. Hosp. Bull.* 1919, Sept., 268; ¹⁴*Jour. Amer. Med. Assoc.* 1920, June, 1750; ¹⁵*Amer. Jour. Med. Sci.* 1920, Jan., 8; ¹⁶*Centraib. f. Chir.* 1920, Jan. 24, 77; ¹⁷*Jour. Amer. Med. Assoc.* 1920, March 27, 923; ¹⁸*Surg. Gynecol. and Obst.* 1920, March, 220 (abstr.); ¹⁹*Boston Med. and Surg. Jour.* 1920, July 15, 67; ²⁰*Jour. Amer. Med. Assoc.* 1919, Dec. 6, 1751; ²¹*Boston Med. and Surg. Jour.* 1919, Nov. 13, 573; ²²*Practitioner*, 1920, Aug., 81; ²³*Surg. Gynecol. and Obst.* 1920, Feb., 180; ²⁴*Ibid.* July, 67; ²⁵*Edin. Med. Jour.* 1920, June, 372; ²⁶*Jour. Amer. Med. Assoc.* 1920, July 3, 12; ²⁷*Presse méd.* 1919, Oct. 18, 604; ²⁸Abstr. in *Jour. Amer. Med. Assoc.* 1920, July 3, 72; ²⁹*Lyon. chir.* 1920, Jan.-Feb., 113; ³⁰*Centraib. f. Chir.* 1919, Oct. 19, 841; ³¹*N. Y. Med. Jour.* 1920, May 29, 931.

KRAUROSIS VULVÆ. (See VULVA.)

LABOUR.

W. E. Fothergill, M.D.

The Protection of the Perineum.—J. W. Ballantyne,¹ in a careful critical review, divides methods of trying to save the perineum from laceration into three groups: (1) Leaving the perineum alone; (2) Operative interference; (3) Protecting, guarding, supporting, saving, or simply caring for the structure in question.

As to operative interference, interest lies in the question whether lateral or bilateral episiotomy is preferable to median perineotomy, which has been recently advocated in an extreme form and for all primiparæ by Pomeroy. Ballantyne says that dilatation of the sphincter ani, followed by complete incision of the perineum, and possibly also of the sphincter, challenges inquiry, and raises the question whether the perineum can best be protected by temporarily abolishing it. On the other hand, he says that whilst he has never regretted doing episiotomy, he has now and again been sorry he did not do it. The devices of the third group do not suffice for the abnormal presentations and positions, for pelvic contractions (especially the funnel-shaped one), or for cases in which the head is too large or too markedly ossified. Ballantyne therefore favours the general use of the various protective methods, supplemented in certain cases by episiotomy.

[Neither the reviewer nor any of the many authorities quoted would appear to have realized that the perineum is stretched when the legs are flexed on the abdomen and is relaxed when the legs are extended. A man's trousers do not crack at the fork when he is standing but when he is squatting. Hence the general rule that when the head is being born the mother's legs should be fully extended. If this rule be observed, none of the other protective devices are required in ordinary cases. In the abnormal cases episiotomy is a good

and useful operation. Extending the legs to save the perineum has been taught to hundreds of pupil midwives and students of medicine. It has also been 'published' many times since the days when Mr. Lawson Tait used to say that "when he was young he supported the perineum, but when he was older it supported him". That was after he had devised his poor but passable flap-splitting method of repairing it.—W. E. F.]

Separation of Placenta.—G. Sklavounos,² an anatomist of Athens, describes the separation of the placenta by injecting boiled salt water into it through the umbilical vein. The method was tried in thirty cases in the University Lying-in Hospital. In most of these the placenta was expelled spontaneously in from three to five minutes after injection. In a few cases manual expression was required. The writer mentions that 100 years ago Mojon, of Genoa, described a similar method, but used cold water. He wonders that such a reasonable method, once proposed, should have been completely abandoned, and thinks that it may be revived now that it is done with antiseptic precautions. It produces a complete filling of the vascular system of the placenta, and therefore a swelling of the villi. The injected hot salt solution increases the natural hæmatoma behind the placenta. The water is used at a temperature of 50° to 60° C., and contains 15 to 20 per cent of salt and 2 per cent of citrate of sodium. When the separation of the placenta begins, the water, blood-stained, begins to run out of the vagina. The bulky placenta is soon expelled into the vagina by the uterus, which contracts very firmly thereafter, so that bleeding is reduced to a minimum.

REFERENCES.—¹*Edin. Med. Jour.* 1919, Dec., 407; ²*Surg. Gynecol. and Obst.* 1920, Feb., 168.

LABYRINTHITIS. (See EAR, INNER.)

LARYNX, CANCER OF.

A. J. Wright, M.B., F.R.C.S.

Semon, in 1886, stated that malignant tumours of the vocal cords usually cause an impairment of mobility at a very early period. This doctrine has been widely accepted, and mobility of the cord has frequently been regarded as strong evidence of the non-malignant nature of a new growth. In 1907, however, as a result of further experience, Semon stated that, while the presence of impaired mobility was strong evidence of malignancy, its absence by no means excluded it. StClair Thomson¹ re-examines this question in the light of 44 cases operated on and proved malignant. Of these 44 cases, the affected cord was quite mobile in 27. It was only possible to remove a satisfactory portion of growth before operation for microscopic examination in 10 cases, and in 8 of these the cord was freely mobile. Thus, impaired mobility, when present, is a valuable diagnostic aid, being more apt to occur in cases in which a portion cannot be removed for examination; but it is not a necessary or frequent symptom of laryngeal carcinoma. When present, it is an unfavourable prognostic symptom, only 7 cases of 17 showing this symptom being alive and free from recurrence after operation. It is more frequently present where the growth is growing into the cord, rather than implanted upon it as a sessile or even pedunculated tumour.

Total Laryngectomy for Carcinoma.—Hoshino,² from an experience of 16 laryngectomies with no operative mortality and with a cure in 50 per cent of cases, has come to some conclusions as to the most suitable technique. Local anaesthesia is easy and safe; two lateral skin flaps are preferable to one large one; the trachea should be divided and tube inserted before removing the larynx; and the pharyngeal wound should be united with a double layer of sutures, but the mucous membrane should be approximated in the submucous

layer. Gluck's method of leaving an intact bridge of skin between the tracheotomy and main wound is important. A simple tube from tracheal wound to lips is a better apparatus for speech than the more complicated artificial larynx.

The total removal of the larynx is frequently regarded as of so mutilating a nature that its justifiability is doubtful. Symonds,³ to combat this view, relates the after-history of four cases. These four people, three men and one woman, have lived in comfort and happiness, and done useful work, for 8, 12, 15½, and 22 years respectively. It is important to make a careful estimate of

the extent of the growth before deciding on operation, as tumours which have arisen in the pharynx and extended later to the larynx are unsuitable for operation (see, however, PHARYNX, CANCER OF). All these four cases developed a fairly good pharyngeal voice, one of them being able to continue his duties as a collector of taxes. With the aid of a special speaking-tube, by which air is conducted to the lips from the tracheal opening, these patients were able to speak clearly under almost all conditions, although for conversation in the domestic circle such an aid was unnecessary.

Radium Treatment.—Freer⁴ has devised an applicator for prolonged surface applications to the larynx in carcinoma, papilloma, or other conditions in which radium applications are indicated (Fig. 42). It consists of a malleable copper rod to which the container is fastened at one end, while

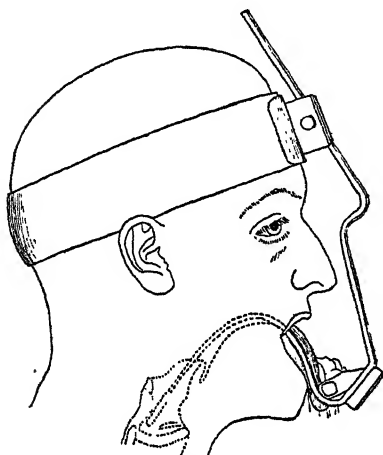


Fig. 42.—Freer's radium applicator in place in the larynx.

(Redrawn from 'The Laryngoscope'.)

the apparatus is fixed to the patient's forehead by clamp and webbing band. The rod is bent to suit the conformation of the parts as required. To keep the container small enough, emanations are employed rather than the radium salt, the applications lasting for from half an hour to an hour, and being repeated as often as necessary. Anæsthesia is induced with cocaine, and, if necessary, maintained by a spray of the same substance while the apparatus is in position. A powerful saliva pump is usually necessary. Detailed instructions are given for manufacturing the apparatus.

REFERENCES.—¹*Lancet*, 1920, ii, 183; ²*Ann. of Otol. Rhinol. and. Laryngol.* 1919, xxviii, 466; ³*Lancet*, 1920, i, 652; ⁴*Laryngoscope*, 1920, May, 298.

LEISHMANIASIS. (See KALA-AZAR.)

LEPROSY.

Sir Leonard Rogers, M.D., F.R.S.

Soluble Derivatives of Chaulmoogra Oil.—H. T. Holman and A. L. Dean¹ report work on the fractionation of chaulmoogra oil on the lines first used by Rogers, but they consider the liquid ethyl esters of the fatty acids to be more suitable for injection than the sodium salts or soaps used by the last-named worker, and record favourable results from the trial of their product in leprosy.

E. L. Walker and M. A. Sweeney² record investigations of the bactericidal properties of substances contained in chaulmoogra oil, which they found to be one hundred times as active as phenol and to be specific against acid-fast bacilli.

Although the amounts present in the blood after intravenous injection would not be sufficient to be directly lethal to the leprosy bacillus, they may possibly become concentrated in the leprous tissues, or inhibit or damage the bacilli sufficiently to render them subject to the natural immunity responses of the tissues. The writers did not find sodium morrhuate to possess the special bactericidal activity of the corresponding chaulmoogric compounds.

A series of papers on trials of **Sodium Hydnocarpate** and **Sodium Morrhuate** in leprosy were read at a leprosy conference in Calcutta in February, 1920, of which the following is a brief summary. E. Muir³ reported on trials by thirteen medical officers of leper asylums in India in 300 cases, mostly advanced, while the treatment varied in duration from two months upwards. Improvement was recorded in 72 per cent, while in 32 per cent much improvement was noted. The results with the two drugs were practically identical, sodium morrhuate having proved as effective as the first-used hydnocarpate. In cases treated by Muir and Davies for from six months to two years, 100 per cent showed improvement, and in some the symptoms cleared up altogether. E. F. Neve⁴ in Kashmir tried these drugs in forty cases, mostly advanced chronic ones, and obtained similar improvement with each of them, benefit being obtained in about half the cases within six months, so he considered the results to be encouraging. M. Cathew⁵ contributed a further report on his Siam jail cases, which showed that out of 18 cases, 4 were lost sight of, 2 of whom had shown very great improvement. Of the remaining 14, none showed no improvement, 1 showed slight and 1 general improvement, 8 very marked improvement, while in the remaining 4 the lesions had completely disappeared and remained absent for from six to eighteen months: a very satisfactory record. L. Rogers⁶ opened the discussion with an account of his results up to date, including the later results of all who could be followed up. Of 71 cases there were: not improved 1, slightly improved 12, much improved 32, and lesions completely disappeared 26. Of 34 cases followed up for some months there were: not improved 1, further improved 5, lesions disappeared on further treatment 5 (bringing that class up to 65 per cent of cases treated for long), remaining well 13, and 5 relapsed. Four of the earlier cases have now remained well for over two and a half years, and 6 more of the second series for upwards of a year; but he still thinks it too early to speak of cures. He also records the following further progress in his researches. The success of sodium morrhuate in leprosy led him to make similar preparations from other oils containing a high proportion of unsaturated fatty acids, and one of these made from soya bean oil—conveniently called **Sodium Soyate**—proved to be even less irritating to the tissues than sodium morrhuate, while one leprosy case became bacteriologically negative under painless subcutaneous injections of this new drug in three months, although the results were not so rapid in other cases: which opens up a still larger field of research. He had also made ethyl esters of both hydnocarpic acid and the unsaturated fatty acids of cod-liver oil (independently of the work of Holman and Dean reported above), but had not yet found them to be more active than the soaps, which are the natural form in which fatty acids are absorbed from the digestive canal.

E. Muir⁷ writes on the after-treatment of leprosy, and advises that the patients be kept under observation for several years to enable any signs of returning disease to be promptly treated, while pills of the drugs should be taken orally for some months after the injections are stopped, and some digestible oil taken as a food, such as linseed oil or soya beans. Remarkable improvement may take place for some time after the injections are stopped, probably owing to the drug being retained for some time in the system, so a further short course of injections after two or three months' rest appears to be indicated in the after-treatment.

J. Brito Foresti⁸ finds leprosy common in Montevideo. During febrile periods Salleylate of Soda was useful. Underhill, Honeij, and Bogart⁹ have found that leprosy patients retain calcium in relatively large quantities, and think that abundant calcium in the diet might possibly retard the disease.

P. Gunguli¹⁰ reports on five cases of leprosy in sepoys treated with sodium morrhuate and sodium hydnocarpate, three of whom were discharged 'cured' by a medical board, while the other two are practically cured. He found alternating the two drugs to be advantageous, and thought the morrhuate to be more effective in nerve lesions.

REFERENCES.—¹*Jour. Cutan. Dis.* 1919, xxxvii, 367; ²*Jour. of Infect. Dis.* 1920, xxvi, 238 (see also *Jour. Amer. Med. Assoc.* 1920, i, 1578); ³*Ind. Med. Gaz.* 1920, 121; ⁴*Ibid.* 128; ⁵*Ibid.* 134; ⁶*Ibid.* 125; ⁷*Ibid.* 139; ⁸*Jour. Amer. Med. Assoc.* 1919, ii, 1734; ⁹*Ibid.* 1920, i, 1407; ¹⁰*Ind. Med. Gaz.* 1920, 286.

LEUCOCYTOSIS. (See also BLOOD, CYTOLOGY OF.) O. C. Gruner, M.D.

As in the case of anæmia, so it is useful to condense the main features of Pappenheim's life-work on this subject.

Leucocytosis is the manifestation of a certain kind of process. There are two types: one in which the circulating leucocytes are affected; the other in which the marrow is implicated—either as a simple functional over-activity, or as an altogether pathological plastic process. In each case there is a 'noxa' at work. Leucopenia is only a form of leucocytosis when seen from this standpoint. A mild stimulus causes more cells to be formed; a very strong stimulus may inhibit formation, exhausting the marrow and paralyzing its proliferative powers.

Since the white cells can be formed anywhere in the body (see BLOOD, CYTOLOGY OF), the kind of leucocytosis is clearly the outcome of the action of each stimulus on the formative perivascular endothelial cells. If the toxin (noxa) can reach the perivascular spaces, it may excite the slumbering clasmatoeytic adventitial cells into activity. Some of these cells are cells of the stroma, which introduces complications.

With such root-conceptions many difficulties disappear. Leukæmia is not a local disease, but a diffuse disorder of the reticulo-endothelial system throughout the body. Aleukæmias, pseudoleukæmias, sarcoid leukæmias, lymphosarcomatosis, granulation-tissue tumours, and many other diseases, find their explanation in terms of the one single pathological process, which sometimes allows immature white cells to enter the circulation; sometimes not; sometimes excites plastic processes in the formative tissues and liberates cells into the blood which can colonize and form 'metastases'; sometimes acts on the purely parenchymal cells of the blood-forming tissues; at other times acts on the stroma; at other times on both. In some cases we know the name of the noxa (tubercle, leprosy, sleeping-sickness, malaria); in other cases the name is not known. In some of these the organism may have left, after setting the morbid process in motion—thus baffling the bacteriologist. The constitution of the patient is also an important factor which determines the type of cytoplasia. The position of the noxa also plays a part—whether it acts in venous or in arterial or in lymphatic medium.

REFERENCES.—(See ANÆMIA.)

LICE AND NITS.

E. Graham Little, M.D., F.R.C.P.

Bacot and Talbot¹ record some interesting experiments they have made to test a claim which has been put forward that soaking in salt water for 24 hours was an effective method of disinfecting verminous sheets. The temperature of the water makes, as the authors soon discerned, a material difference, which may be summarily stated: At temperatures of 60° to 65°

active lice could be revived after immersion for 46 hours in both tap and salt water; but at temperatures of 67° immersion for 46 hours in tap-water killed 3 out of 3, while the same immersion in salt water did not kill any. As the temperature of the water was raised the mortality increased. Nits were even more resistant, and showed a much longer survival period. The conclusion is that the addition of salt gives no increase of efficiency over mere immersion. As a result of experiments with cresol and lysol solutions, temperature also played a most important part. It would seem to be established that the louse exerts a protective mechanism when immersed in solutions of a temperature lower than that of the host, and can close its spiracles so as to keep out the fluid, and so survive actually longer than nits. If the temperature is raised, their metabolism becomes activated, the necessity to take in oxygen by breathing is imperative, and in this way the protective mechanism is overcome. For the destruction of lice and nits in the hair, solutions of Lysol of at least 2 per cent are needed if used cold, and the hair should not be rinsed, but allowed to dry.

REFERENCE.—¹*Brit. Med. Jour.* 1919, ii, 703.

LICHEN NITIDUS.

E. Graham Little, M.D., F.R.C.P.

Sutton¹ adds another case to the meagre list of instances of this disease, and this new case is noteworthy as occurring in a patient without any tuberculous associations, which have been very frequent in previously reported cases. The disease is characterized by the presence of one or more irregular patches, or collections, of numerous smooth, slightly elevated, rounded, pin-point to pin-head sized, pinkish, flesh-coloured papules, some of which are marked by slight central depressions. The mucous membranes are never involved. The presence of the little papules gives rise to no subjective symptoms, and in many instances the discovery of the eruption is accidental. Nearly all of the cases described have occurred in males, and in nearly every instance the penis and the lower part of the abdomen were involved. In a few instances the forearms also were affected.

REFERENCE.—¹*Arch. of Dermatol. and Syph.* 1920, July, 1.

LICHEN PLANUS. (See also 'SKIN DISEASES, MISCELLANEOUS.')

E. Graham Little, M.D., F.R.C.P.

Culver¹ has some interesting statistics on the prevalence of lichen planus in the United States. Of 8000 patients suffering from skin eruptions observed over a period of thirteen years, 148 showed symptoms of lichen planus. The lower extremities were the parts most frequently involved, 80 having the eruption there, the anterior surface of the thigh and about the knee being the commonest location. In 66 the upper extremities were involved, making the lower and upper extremities by far the most frequent locations of the eruption. The forearms and wrists were affected in 20 cases, the wrists 17 times. One always looks carefully at the wrists for a verification of the diagnosis; in 4 instances the wrists alone were affected. The eruption occurred on the hands 16 times, usually on the back, the palms showing it in only 5. In 49 instances, less than a third of the entire number, one or more parts of the trunk showed the eruption. This did not include the base of the neck, one of the most characteristic locations, especially of lichen atrophicus. Involvement of the neck, base of neck, and shoulders occurred 25 times. In 14, or less than 10 per cent of the cases, the eruption was universal. These instances were either acute manifestations of the disease or acute exacerbations of older cases. In a large majority with universal eruptions, fairly rapid improvement occurred under treatment. The eruption occurred on some part of the head

in 17 instances. It was noted on the face 10 times, and on the scalp 9. The penis and scrotum were affected 20 times, the vulva only once. It is of interest to note that during seventeen months, May, 1917, to October, 1918, during which, as the author observes, the tension of the community was at its highest, he noted a cessation of cases, whereas on his average there ought to have been at least 17 cases. He is inclined to explain this by the different habits concerning food which were engendered by the war.

Bichloride of Mercury, in $\frac{1}{32}$ -gr. doses, combined with other medication, is the author's favourite prescription.

The etiology remains doubtful, but the author inclines to regard the toxæmic explanation as the most probable.

REFERENCE.—¹*Arch. of Dermatol. and Syph.* 1920, Jan, 43.

LUMBAR NEURALGIA AND SACRALIZATION OF THE 5th LUMBAR VERTEBRA. (See NEURALGIA.)

LUNG, ABSCESS OF. (See also THORAX, SURGERY OF.)

Arthur Latham, M.D., F.R.C.P.

Tewksbury,¹ reporting on 14 cases of acute pulmonary abscess which he treated with Artificial Pneumothorax, comes to the following conclusions:—

1. Acute pulmonary abscess occurs more frequently in the right lung, 11 of this series being in the right lung and only 3 in the left.

2. The proportion of cure with medical treatment is less than 10 per cent: with surgical treatment from 50 to 65 per cent.

3. Of the 14 patients treated in this series of cases, 11, or 78 per cent, were cured; 3, or 27 per cent, died.

4. Artificial pneumothorax used early is the most rational and successful treatment we have for acute lung abscess.

REFERENCE.—¹*N. Y. Med. Jour.* 1919, Nov. 22, 849.

LUNG, ACUTE ŒDEMA OF.

Arthur Latham, M.D., F.R.C.P.

Amblard¹ states that, in his experience, the persons who developed acute œdema of the lungs always had a history of hæmoptysis at some time or blood-streaked sputum, possibly ascribed mistakenly to tuberculosis, or after trauma: In two cases in which the pulmonary œdema developed under his eyes, he noted that the high blood-pressure ran up still higher, both the minimal and maximal pressure showing a rise of several degrees. Then suddenly the pressure dropped, the maximal from 280 to 140 mm. mercury, for example; the minimal from 180 to 100; while the pulse ran up from 70 to 130. Venesection tided through the period of dyspnoea, but the heart was still unequal to its task, and the blood-pressure never returned to its former figure. Although the latter was abnormally high, yet this was necessary to ensure adequate circulation, even although this was still below normal. Each attack reduces it still lower. The onset in each is sudden, but each is always preceded by the giving way of the ventricle; then the blood-pressure drops, and this in turn is followed by the acute œdema in the lungs; but the heart action keeps up and there is no arrhythmia.

REFERENCE.—¹*Paris méd.* 1920, May 22.

LUPUS VULGARIS.

E. Graham Little, M.D., F.R.C.P.

Mackenna considers treatment under the following heads:—

1. *Excision.*—If the patch is small, and removal will not produce undue disfigurement, excision is the best means.

2. *Caustic Agents.*—Of these he prefers Pyrogallie Acid, which he uses thus:

It is best applied in the form of a 5 to 10 per cent ointment—i.e., 24 to 48 gr. to the ounce. A base of equal parts of lanolin and vaseline supplies a sufficiently adhesive unguent. The ointment should be spread on lint, the weaker strength being used for children, and the stronger for adults. After a few days the pyrogallic acid begins to break down the lupus patch, and produces an ulcerating surface. The dressing, changed night and morning, should be continued as long as the patient can bear it. When severe pain supervenes—or earlier in the case of children—the application should be stopped and the ulcer dressed with starch and boric poultices. This soothing application rapidly brings about a restitution of epithelium over the tuberculous tissue, and when this stage is reached it will be found that the lupus patch is considerably thinner. The application of pyrogallic acid should then be renewed, and the patch broken down once more.

3. *Scarification and Curetting*.—This should be done under a general anæsthetic, and a six-bladed instrument with sharp blades used, the tuberculous tissues being cut up in all directions till reduced to a pulp. When the tissues have been thoroughly chopped up and bleeding is arrested, the part should be dressed with a simple ointment such as Ichthyol 2 gr., Vaseline 1 oz., or a dressing of *Unguentum Glycerini Plumbi Subacetatis* may be applied, which has the advantage of producing an exosmosis that flushes the part with serum. To get the best results from linear scarification, one must repeat the process every fourteen days or so, carrying it out with thoroughness on each occasion.

4. *Freezing*.—This should be done with a solid stick of Carbon Dioxide Snow a little larger than the lesion to be treated. Application may be made for one and a half to two minutes. Carbon dioxide snow is of special value in cases where (a) the lesion is on the cheeks; (b) it is single and not too extensive; and (c) it is hypertrophic rather than atrophic in type. It is also very valuable for melting down the thickened edge of an extensive and spreading patch of the disease. It should not be used in elderly people and in poorly-nourished young children.

5. *Electrotherapeutics* (see also ELECTROTHERAPEUTICS, p. 24).—MacKenna deprecates the use of X Rays except with special precautions, as in his view their use may explain the tendency of lupus patches to become epitheliomatous. He advises not more than a third of a pastille dose, filtered through boiler felt, and not at shorter intervals than a fortnight, nor in an aggregate dose of more than two pastilles. The Kromayer Mercury Vapour Lamp may also be used. The skin adjacent to the site to be treated is covered with lead foil, leaving uncovered a border of sound skin $\frac{1}{2}$ in. broad all round the lupus patch. This sound skin and the lupus patch are then exposed to the rays of the lamp, the front lens of which should be at a distance of 3 in. from the part to be treated. In many cases there is a mild sensation of burning felt by the patient, but this rarely becomes intolerable. Children can easily stand seven and a half minutes' exposure, and adults tolerate ten minutes' without complaining. He has also found Tungsten Light very satisfactory, used much on the lines of the Kromayer lamp.

6. *Ionization*.—This is an excellent method for small deep nodules. The part is to be prepared by wiping over with cotton-wool soaked in liquor potassæ B.P. This denudes the nodules of their epithelial covering, while it leaves the sound epithelium of the adjacent skin almost intact. The nodules are thus exposed, and appear as moist gelatinous-looking masses embedded in the skin. The alkali is then removed by wiping the part with a little distilled water. A pad of two thicknesses of lint soaked either in 2 per cent Zinc Chloride solution or in a 10 per cent solution of Zinc Sulphate is then laid over the area to be treated, and an electrode of pure metallic zinc attached to

the positive pole of the battery is applied with firm pressure. The indifferent electrode is applied to any convenient part of the body. A current of 2 to 3 ma. per square cm. of area treated is applied for 10, 15, or 20 minutes, varying with the extent of the disease and tolerance of the patient. At the end of a treatment the lupus nodules are found to be dry and glazed and surrounded by a whitish collar of coagulated albumin. Considerable redness and swelling follow the treatment. The part may be dressed with a detergent lotion, in which case a crust will form, or it may be dressed with a simple ointment. The reaction subsides in about a week, and the treatment may be repeated at fortnightly intervals.

7. *Electrocautery*.—This is particularly suitable to lesions of mucosæ. The surface should be anæsthetized by cocaine or novocain, and the current graduated so as to produce a dull red heat. The cautery point is to be applied cold, and the current then switched on.

8. *Tuberculin*.—This method has been nothing but a disappointment.

9. *Salvarsan*.—This also is disappointing.

Ellis² reports some investigations he has made which lead him to claim that he has improved on his 'Picric Brass' method (see MEDICAL ANNUAL, 1920, p. 5). This method was discussed adversely at a meeting of the Dermatological Section of the Royal Society of Medicine at which Dr. Ellis attended, and he now regards his new combination as superior. This is made by adding picric acid to sulphanilic acid and raising to a temperature of 100° C., a subsequent addition of 1 per cent of carbolic acid being made. This preparation is of a brown colour, and remains fluid at ordinary temperatures. It contains about 2 per cent picric acid. It is claimed that it attacks selectively tuberculous tissue and is harmless to healthy skin. Ellis advises its use apparently in combination with his brass-oil preparations. The present method of application to an ordinary case of lupus is first to clean up the affected area by a few brass-oil fomentations at two or three days' intervals, and, when the area has been cleaned up in this way, the selected piece of tissue where treatment is most desired is rendered anæsthetic by applying adrenalin and cocaine or other local anæsthetic. After drying off the moisture, the sulphanilic-picric is applied with a glass rod, and a short interval is allowed while it penetrates the tuberculous tissue. If the surface is broken and not sufficiently anæsthetized, the pain may be considerable, but bearable. If the surface is unbroken, the pain is usually slight. The time of waiting for the picric to penetrate is from five to ten minutes. The sulphanilic gradually stains the affected tissue yellow. The way in which it picks out the tuberculous invasion is quite interesting. If the area is reasonably small and the destruction of the tuberculous tissue the primary consideration, the whole area is then dressed with brass paste under strapping, in the usual way; or, if a lesser action is desired, it may be smeared over with the picric brass and left exposed, in which case the action is not so vigorous. If the case is at all a bad one and extensive deposits exist, it is better to apply a brass-oil fomentation, or even only to paint it over with the brass oil. These applications are applied twice or thrice weekly, as circumstances dictate, with occasional rests so as to be sure what progress has been made. There are thus four degrees of destruction available. The destruction produced by picric-brass paste under strapping, after the application of sulphanilic-picric, is very extensive and sometimes painful, but the destruction is limited to the tuberculous tissue, the neighbouring tissue only being engorged from the irritation produced; the destruction removes the tissue most efficiently, rarely needing more than three or four applications, each being less painful as the destruction and reaction become more limited by the removal of the tuberculous masses.

Adamson³ has revived the use of Acid Nitrate of Mercury as a selective caustic in the treatment of lupus, and describes his procedure. He divides the cases into four groups :—

1. Single patches of non-ulcerated lupus of the size of a shilling to that of half a crown, and which have received no previous treatment.

2. Old cases of lupus which have been treated by other methods, but in which lupus nodules still remain in the scars.

3. Ulcerated lupus, often of large extent and with much surrounding inflammatory infiltration.

4. The common type of lupus of the nose, involving frequently also the nasal septum, the palate, the upper lip, the cheek, and sometimes the lachrymal sac and skin over and around, a type very difficult to deal with by Finsen light or by scraping.

The liquid acid nitrate of mercury is applied by means of a small swab of wool tightly twisted round the ends of a finely-pointed pair of forceps. It is painted on to the affected areas freely and with firm pressure for one to two minutes, taking care to limit the application exactly to the lupus patches, to isolated nodules, or to ulcerated surfaces. In the case of isolated nodules or non-ulcerated lupus patches, the effect of the application after a minute or so is to change the semi-translucent reddish-brown 'apple-jelly' lupus tissue, so that it takes a dry yellowish-white opaque appearance. No dressing is applied, and the patient is seen again in a week. The yellowish-white opaque appearance has then given place to a thin brownish crust, which falls in a few days and leaves the affected area sometimes completely healed, and sometimes as a shallow ulcer which heals in a few days. In many instances a single application has been sufficient to replace the lupus by a smooth healthy scar without any remaining lupus nodules. In other cases isolated nodules have remained in the scar and it has been necessary to repeat the application one or more times. The application is only slightly painful at the time, but is followed by more severe pain for several hours.

In the case of ulcerated lupus, after removing all crusts, the solution is freely painted on to the ulcerated surface. This causes considerable pain, but if not too large an area be done at one sitting it is easily borne by most patients. The after-effect upon ulcerated surfaces is rather different from that upon non-ulcerated lupus. The surface of the ulcer becomes dry yellowish-white, but in a few days much serous exudation gives rise to a thick heaping up of crust. At the end of a week the crusts are picked off, or bathed off, and there is then an ulceration with purulent surface, and a margin of pink healthy epidermis which heals in the course of a week or so. The number of applications required in an ulcerated lupus depends upon the extent of the disease and the depth of the inflammatory infiltration which often accompanies these ulcerations.

In the fourth class of case the method is especially useful. The solution may be carefully painted on the lesions on the mucosa, and a lachrymal abscess may be swabbed with it. A general anæsthetic is advisable if a large area is to be treated at one sitting, but with more gradual treatment no anæsthetic is necessary.

Aitken⁴ reports the results obtained in the practice of Norman Walker with Tuberculin. He divides the cases into two classes—those treated with Koch's new tuberculin (T.R.), and those treated with old tuberculin (O.T.). The former class, few in number, did uniformly well. In the other class there was satisfactory improvement, but not so definitely. The Kromayer lamp was used in conjunction with tuberculin in several of the cases recorded, which number eleven in all.

Moncorps and Monheim³ advocate massaging Iodine into the lupus patch, and then exposing to x rays. Free iodine is thereby generated, and the method is claimed to produce excellent results.

REFERENCES.—¹*Lancet*, 1919, ii, 917; ²*Ibid.* 827; ³*Brit. Med. Jour.* 1920, ii, 123; ⁴*Edin. Med. Jour.* 1920, April, 251; ⁵*Zeits. f. Tuberc.* 1920, April, 32 (abstr. in *Jour. Amer. Med. Assoc.* 1920, July 31).

LYMPHANGIOMATA. (See HEMANGIOMATA AND LYMPHANGIOMATA.)

LYMPHOSARCOMA AND HODGKIN'S DISEASE.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Levin¹ points out that the chief characteristic of Hodgkin's disease is a swelling of the lymph-glands which increases in size very rapidly. Microscopically these glands show a multiplication of all types of cells usually met with in a normal lymph-gland. Morphologically the condition resembles rather an infectious disease than a malignant tumour. Nevertheless, the important features of Hodgkin's disease set it apart from any known parasitic or inflammatory condition. The swelling of the lymph-glands rapidly increases in size, and the disease usually terminates fatally, so that in all respects the disease is clinically quite analogous to cancer. The active proliferation of the cells of the lymph-glands is limitless, and ends only in death of the organism. The cell in Hodgkin's disease is therefore biologically identical with the cancer-cell. Lymphosarcoma glands differ microscopically from Hodgkin's granuloma inasmuch as they usually show the proliferation of one type of the cells of the lymph-glands, either the reticulum cells or the lymphocytes. Furthermore, in lymphosarcoma the cells break through the capsule of the glands and invade adjoining tissue. The writer of this paper maintains that both conditions may be met with side by side in the same patient, and that both are only gradations of the same disease. It is evident also that there exists a very close relationship between Hodgkin's disease and tuberculosis. The tubercle bacillus or some other infectious agent produces an inflammatory lymphoma, and subsequently an unknown etiological agent transforms the latter into a malignant lymphoma. Good results seem to have followed the application of radium in the case of both Hodgkin's disease and lymphosarcoma. It has been demonstrated that the employment of Radium and X Rays subsequent to operation enhances the chances of ultimate success. These are the best-known therapeutic agents in Hodgkin's disease and in lymphosarcoma. The affected lymph-glands diminish rapidly in size, and there is a marked improvement in the condition of the patient. Besides the affected lymph-glands, the spleen should be subjected to the same treatment. The treatment of these cases should be continued for months. Unsatisfactory results are probably due to the fact that radium and x -ray treatment is only attempted late in the disease and is not pursued with sufficient energy. In a few early cases the writer succeeded in arresting the disease for a number of years; half measures are less than useless.

REFERENCE.—¹*Ann. of Surg.* 1919, 561.

MADURA FOOT.

E. Graham Little, M.D., F.R.C.P.

Belák¹ describes two varieties of fungus as grown from madura foot: (1) A black fungus approximating to trichophyton, with typical cultures on glycerin potato and on Sabouraud media. It liquefies gelatin. Inoculation experiments in guinea-pigs failed. (2) A white fungus growing more rapidly than the first, not liquefying gelatin.

REFERENCE.—¹*Centralb. f. Bakteriöl.* 1919, Oct., 31, 528.

MALARIA.

Sir Leonard Rogers, M.D., F.R.S.

PREVALENCE AND CONTROL.—Wickliffe Ross,¹ of the International Health Board, describes a number of field experiments in the United States to ascertain the degree of efficiency and cost of certain antimalarial measures under different conditions. Firstly, after a careful survey of the conditions, anti-mosquito measures were tried in a small lumber town of 2129 inhabitants, in which 60 per cent of illness was due to malaria. Costly major drainage operations were excluded, and the breeding-places were dealt with on the usual lines. The mosquito pest was rapidly eliminated, and the medical attendance for malaria was reduced by 70 per cent in the first year and by 97 per cent after three years, at a cost in the last year of only \$0.33 per head of population. At the end of the first year the value of the measures was so clear that the community took over the work and its cost. Similar results were obtained in the following year in another small worse-infected town, and in the third year four more places were dealt with, and in each the work was proved to be a paying business proposition. In a very malarious rural area with scattered population, screening of all the houses against mosquitoes was carried out at an annual cost of \$1.75 per head per annum, and a 70 per cent reduction in malaria obtained. In a third experiment, Quinine immunization was tested in the form of 5 gr. twice a day for two successive days in each week for adults, and 1 gr. for every three years in children under fifteen years. A reduction in the parasitic index of 64.45 per cent was obtained by the end of the year: a very satisfactory result in view of the present scepticism regarding this measure. Fourthly, the value of control by treating malarial carriers was tested in Bolivar County, Miss., by a two-year field experiment. It was found that 10 gr. of quinine a day for eight weeks sterilized the blood of about 90 per cent of the carriers. A rural area was then selected in a very malarious deltaic area, where mosquito destruction at any feasible cost was impossible. Among 9000 inhabitants, three-fourths negroes, 70 per cent of the sickness disability was due to malaria, the medical cost of treating which was \$5 per head on one plantation. As a result of the trial there was no transmission of malaria in the small town of the district, while in the rural areas the reduction in the malaria was estimated to be 80 per cent. Quinine had been given in 10-gr. doses for eight weeks to the 40 per cent of the population who had suffered from clinical malaria within the last twelve months, and also to 22 per cent showing malarial parasites in their blood. Further work will be carried out, but it has already been demonstrated that simple and effective antimalarial measures can be adopted in very malarious places at a cost which makes them a paying proposition, when the loss due to the malaria is taken into account.

W. E. Darnall² deals with mosquito control work in the Atlantic coast counties of New Jersey, where much pioneer work has been done for years past. These measures were very successful in preventing all malaria in an embarkation camp at Merritt, in a malarial area, during the war. In swampy areas 1100 miles of standard machine-cut drains, 10 by 30 inches ditching, were cut for draining salt marshes.

P. Manson-Bahr³ records a good account of malaria in the Egyptian and Palestine war areas, where *Cellia pharonensis* was the most important carrier. The splenic index in children was as high as 96.4 per cent in some areas. On account of many severe and fatal cases of malaria not being recognized, as shown by post-mortems, when highly malarious Palestine areas were reached, field malaria diagnosing units were organized, each dealing with up to 100 blood-slides a day, and proved very useful, although during the final rapid advance they could not deal with the situation, and a great increase of malaria

took place. A few doses of quinine intramuscularly at the beginning of treatment in bad cases were found to be of great value.

M. Chambelland⁴ records successful culture of malarial parasites, and found that the organisms were more numerous and vigorous with a technique allowing of the removal of the toxins formed by them.

CLINICAL AND PATHOLOGICAL.—R. A. Gutmann and R. Porax⁵ discuss the occurrence of low temperatures in malaria, and point out that periodical slight rises to just above the normal line may be of diagnostic significance. A. T. W. Forrester⁶ deals with malaria and insanity, and describes both mental symptoms associated with febrile attacks, often in patients with bad family histories, and those occurring after repeated malarial attacks, mental confusion and depression being the most common. The prognosis is comparatively good if the malarial element is recognized and treated. J. B. Hume⁷ describes seven cases of enlarged thyroid in malaria, which he attributes to sporulation of the parasites in the capillaries of the gland. He also refers to degenerative changes of the adrenals, and to orchitis occurring in malaria. W. H. Manson⁸ reports ulceration of the cornea, and more rarely intra-ocular hæmorrhage and lesions of the ocular nerves, as sequelæ of malaria. D. W. Carmalt Jones⁹ writes on various complications of malaria affecting the circulatory system in the form of myocardial change and vascular lesions, hæmorrhages and thrombosis; the respiratory system, as congestion of the lungs; as well as the better-known intestinal and cerebral forms of malaria. R. G. Brun¹⁰ records post-operative febrile attacks due to malaria, and advises prophylactic Quinine before operating in such subjects. B. Kaufman¹¹ writes on malaria during pregnancy, and supports the common view that quinine is only beneficial in such cases.

J. F. Gaskell and W. L. Millar¹² give an elaborate account of their investigations of malignant tertian malaria in Macedonia, including the changes found post mortem in three classes of fatal cases. In the comatose cases they found no definite evidence of thrombosis in the cortical vessels, and attribute the symptoms to hæmorrhages into the white matter secondary to degenerative changes in the small blood-vessels occurring in chronic malarial infections, as shown by the number of crescents in the internal organs. No treatment was of any avail in such cases. The second type of fatal case is one in which there are enormous numbers of parasites in the peripheral blood, making it septicæmic in nature, and they regard the appearance in the peripheral circulation of nearly fully grown, but not yet sporulating, forms of the malignant tertian parasite, as a warning sign of danger. Repeated estimations of the number of parasites in a cubic millimetre of blood show rapid increase in spite of full oral or intramuscular quinine, and when the number reaches over 5000 per c.mm. the danger point is reached, and intravenous injections of full, 15-gr., doses of quinine are indicated, and will save patients in whom the number of parasites has not already reached a very high degree, when toxæmia may still cause death. A third type, which is sometimes combined with the septicæmic form in an intermediate condition, is the cardiac one in which fatty degeneration and fragmentation of the heart muscle-fibres is found after death from cardiac failure; indicating cardiac treatment, although quinine is also required and can safely be given in full doses. They have also sought for the resting-place of the parasites in the tissues, and found ring parasites within the heart muscle-fibres, and suggest the possibility of their living for long in ordinary muscle-fibres, although they have not demonstrated them in this position.

H. Alamartine and H. Vandenbosche,¹³ in dealing with the surgical complications of malaria, describe pseudo-appendicitis, fragility of the liver, and

gangrene of the lower limbs, sometimes symmetrical in nature, due to obliterating endarteritis.

PHARMACOLOGY AND TREATMENT.

Quinine Treatment.—W. E. Dixon¹⁴ opened a discussion on the pharmacology of the alkaloids of Quinine at the British Medical Association meeting at Cambridge, and after speaking of the chemical constitution of quinine, gave a table of the action of different compounds on living protoplasm in the form of *Paramæcia*, on which methyl prospinine was the most active. Against bacteria the most striking lethal action is that of ethyl hydrocupreine against the pneumococcus, although it has not proved of much value in treating pneumonia, while it has serious toxic action on the ocular nerve. Eucuprinotoxine has great local anæsthetic properties. The mode of action and administration of the drug were also discussed. W. Ramsden¹⁴ described the destruction of quinine by liver pulp, its concentration in the suprarenals, kidney, and spleen, and pointed out that very high concentrations of the drug in the blood for two days did not radically cure malaria; so he suggested that the action of the drug might not be a direct one, but through some metabolite of quinine produced in the tissues which destroy the drug. W. H. Acton^{14, 15} records interesting researches on the treatment of relapsing benign tertian malaria in a military camp at Dagshai in the Simla hills above the endemic area. He found the height of the relapse curve occurred four weeks after the completion of various courses of treatment with quinine, while the percentage of cures, as estimated by freedom from relapse for at least two months after cessation of treatment, varied from 18 to 80 per cent after two months' courses, to 52·6 per cent after continuous treatment for four months. Further courses only cured about 25 per cent of the remaining cases. He then tried cinchona febrifuge, containing 18 per cent of cinchonine, 6 per cent of cinchonidine, 7 per cent of quinine, and 22 per cent of quinidine, and obtained 50 per cent of cures, while quinidine sulphate and cinchonidine sulphate each cured 63 per cent of smaller series of cases, and he therefore looks on quinidine as having a special action against benign tertian malaria, which will be important if confirmed, as cinchona febrifuge containing an active amount of quinidine and cinchonidine is much cheaper than pure quinine.

B. Mayne¹⁶ has found the following easily remembered formula for a seventy-five days' course totalling 200 gr. of quinine, definitely curative of malaria, preventing relapses: 40 gr. daily for five days, 20 gr. for ten days, 10 gr. for twenty days, and 5 gr. for forty days. H. R. Carter,¹⁶ in a comment on the above, states that he is in agreement with the principle and in general agreement with the details, but does not think it advisable to lay it down as a definite formula for all cases in the present state of our knowledge. Henry Fraser,¹⁷ with long experience in the Federated Malay States, records his experience in a large military malarial camp in England. If the tongue is kept clean, patients have no difficulty in taking quinine, while no man can relapse while taking 15 gr. daily in solution—best given in one dose, smaller amounts being insufficient, and continued as long as possible, the men not being kept long in hospital. When a relapse has occurred, 15 gr. should be given twice daily for five days and then once a day, the first dose being given when the temperature is falling, to avoid sickness. He attaches no importance to tonics. A. G. Phear¹⁸, with Macedonian experience, after a purge gives three to four doses of 15 gr. of quinine sulphate for the first few days, or, if there is much vomiting, two 20-gr. doses intramuscularly, reserving intravenous injections for cerebral cases. J. A. Taylor¹⁹ lays stress on a preliminary dose of 5 gr. of calomel followed by a saline purge before beginning quinine, the latter being given in four 5-gr. doses before noon, before the temperature

risers. He thinks the calomel prevents serious complications of blackwater fever, which rarely occurs in cases so treated. His experience was in Uganda at a height of 3000 feet, where he thinks malaria may be comparatively mild.

In persons showing idiosyncrasy to quinine in the form of smarting and œdema J. J. O'Malley and De Wayne G. Richey²⁰ obtained cutaneous reactions within four to five minutes of applying a 1-10 solution of quinine bisulphate to the scratch of a needle, which did not occur in control subjects. They succeeded in desensitizing one of the patients by Heran and Saint Girons' method of giving by the mouth each day 0.005 grm. of quinine bisulphate with 0.5 grm. of sodium bicarbonate and following it after an hour and a half with 0.1 grm. of quinine, increased by 0.1 grm. each day, with a constant dose of 0.5 grm. of sodium bicarbonate, and at the end of the eleventh day 2 grms. of quinine produced no bad symptoms. In the other case the dose could not be raised above 0.7 grm.

R. McCarrison and J. W. Cornwall²¹ discuss quinine preparations, and agree with a former observer that the acid hydrobromide is less noxious than the hydrochlorides, especially in its action on the respiratory centre, and may be given up to 15-gr. doses. Dilution of the quinine solution with a large volume of salt solution did not compensate for its depressing action on the blood-pressure and respiration. Intravenous injections should be given very slowly, while epinephrin given with the quinine counteracts to some extent the fall in blood-pressure.

A. G. Phear²² records his experience of malaria in Macedonia and the Caucasus, the latter being by far the more healthy country. The seasonal incidence was similar to that in India and elsewhere. Malaria was difficult to diagnose clinically from the influenza epidemic cases. He reports a very anæmic case which was saved by two blood transfusions. In cerebral malaria intravenous quinine saved many lives. In relapsing cases week-end treatment by 30 gr. of quinine on two successive days each week for a very long time raised the non-relapsing cases from 32 to 78 per cent. Intramuscular injections are rarely required except when oral treatment has failed, when they are often effective, and cause little trouble except when the patient is debilitated by dysentery.

The War Office has issued a volume of *Observations on Malaria*, edited by R. Ross.²³ In a number of malaria-saturated battalions from Salonica, 15 gr. of quinine daily for two weeks, followed by 60 gr. a week for two months, enabled nearly all of the men to re-enter the fighting line. In Taranto in South Italy, drainage and other anti-mosquito measures proved very effective in almost banishing malaria. J. Pratt Johnson²⁴ reports on war malarial work in South Africa, and found mixed infections most resistant, four months' treatment being necessary to cure in most malarial cases. No other drugs proved of service, except arsenical preparations for repairing the blood. The Wassermann reaction was not positive in malaria more frequently than in the general population.

D. S. Ollenbach²⁵ reports favourable results of Rogers' method of injecting cinchonine bihydrochloride intramuscularly in twenty-four cases of malaria.

Quinine Prophylaxis.—On Assam tea estates C. E. P. Forsyth²⁶ has studied the results of the extensively used prophylaxis by daily 5-gr. doses of quinine. After pointing out that administrative difficulties usually result in not more than half the estimated quantities being actually expended, while many of the tablets given are wilfully ejected by the ignorant coolies, he brings forward seven years' figures to show that the complete abandonment of the prophylactic issue of quinine, during 1918, and paying attention to see that all attacks of malaria were more efficiently treated by full doses of the drug

for at least a week, gave better results than those of former years. A direct experiment on one garden showed but very slight reduction in the malaria during the issue of prophylactic quinine over those of an equal period without this measure. He is careful to point out that the Tea Industry does not grudge any expenditure of prophylactic quinine, and that the above trial was made on his own recommendation, and has convinced him that under the conditions of tea-garden work the prophylactic issue is a waste of time and money, which can better be devoted to other more effective antimalarial measures; at the same time he fully recognizes that his conclusions do not affect the question of the value of quinine as a prophylactic when it can be efficiently given in sufficient doses. H. J. Waters²⁷ has come to very similar conclusions as a result of his experience of the East Indian Railway staff in a malarious part of Bengal, and advises thorough treatment of all those infected with malaria, and others in contact with them in their houses, in preference to prophylactic issues of quinine.

A. H. Gosse²⁸ records favourable results in a small hospital staff in Mesopotamia from 5-gr. doses of quinine daily in preventing attacks, several untreated controls alone having contracted malaria. He suggests that the failure of prophylaxis in some other countries, such as Macedonia, may have been due to the virulence of the disease there, due to repeated bites by infected mosquitoes, requiring larger doses of quinine to protect against infection. S. S. Barton²⁹ also records good effects from prophylactic quinine in protecting naval men exposed in very malarious West African creeks, and also in mitigating the severity of such fever infections as occurred.

Other Methods of Treatment.—P. S. Vickerman³⁰ records favourable results in malaria from the intravenous injection of **Eusol** containing at least 5 per cent available hypochlorous acid, and freshly prepared, in 40-c.c. doses, administered from one to three times. An attack of fever with rigor follows the same day, after which the temperature ceases, although parasites may persist in the blood up to ten days. It also works well in chronic cases with enlarged spleen and anaemia. A. Pais³¹ records a large experience with small doses, 1 to 10 or 12 units, of **Radiotherapy** in resisting chronic malaria, and states that the fever soon ceases and the spleens go down. T. Zangger³² claims results in malaria by **Tepid 'Half Baths'** without quinine at a height of 4264 feet in Switzerland. Cartolari³³ advocates **Splenectomy** for the very movable large spleen of malaria when it is causing disturbances, and only lost one out of six cases as a result of the operation. J. N. d'Esterre³⁴ records having successfully treated 38 cases of recurrent malaria with **Novarsenobenzol** intravenously, giving 0.3 grm. for the first two doses and 0.4 grm. for the last two injections.

Arsphenamin recommended in tertian and quotidian forms (p. 4).

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, ii, 1414; ²*Ibid.* 737; ³*Lancet*, 1920, i, 79; ⁴*Presse méd.* 1919, Dec. 20, 783; ⁵*Ibid.* 95; ⁶*Lancet*, 1920, i, 16; ⁷*Brit. Med. Jour.* 1919, ii, 661; ⁸*Glasgow Med. Jour.* 1920, 127; ⁹*Lancet*, 1919, ii, 1131; ¹⁰*Presse méd.* 1919, Dec., 766; ¹¹*N. Y. Med. Jour.* 1919, 1028; ¹²*Quart. Jour. Med.* 1920, 381; ¹³*Surg. Gynecol. and Obst.* 1920, 377; ¹⁴*Brit. Med. Jour.* 1920, ii, 113; ¹⁵*Lancet*, 1920, i, 1257; ¹⁶*Jour. Amer. Med. Assoc.* 1919, ii, 1119; ¹⁷*Lancet*, 1919, ii, 1134; ¹⁸*Ibid.* 1920, i, 195; ¹⁹*Brit. Med. Jour.* 1920, i, 113; ²⁰*Arch. of Internal Med.* 1919, 378; ²¹*Ind. Jour. Med. Research*, 1920, vi, 248; ²²*Lancet*, 1920, ii, 56; ²³*Brit. Med. Jour.* 1920, ii, 872; ²⁴*S. Afric. Med. Jour.* 1920, 107; ²⁵*Ind. Med. Gaz.* 1920, 14; ²⁶*Ibid.* 12; ²⁷*Ibid.* 1919, 344; ²⁸*Lancet*, 1919, ii, 431; ²⁹*Med. Press and Circ.* 1920, 355; ³⁰*Brit. Med. Jour.* 1920, ii, 303; ³¹*Jour. Amer. Med. Assoc.* 1919, ii, 1561; ³²*Lancet*, 1920, i, 766; ³³*Jour. Amer. Med. Assoc.* 1919, ii, 1906; ³⁴*Lancet*, 1920, ii, 552.

O. C. Gruner, M.D.

DIAGNOSIS.—Subcutaneous injections of **Adrenalin** serve for the diagnosis of latent malaria. According to Dazzi,¹ 11 mgrms. adrenalin is constantly followed by the appearance of plasmodia in the blood, within twenty minutes.

In one hour the plasmodia are found in the largest numbers. As adrenalin causes a contraction of the spleen, it is by this means that the plasmodia get into the peripheral circulation again. Habetin² uses 0.5 grm. sodium nucleinate in 10 c.c. saline solution. In this case a febrile attack results, besides bringing the parasites into circulation again.

REFERENCES.—¹*Policlinico* (sez. prat.), 1919, xxvi, 1413; ²*Wien. klin. Woch.* 1919, 1091.

MARASMUS, INFANTILE. (See INFANT FEEDING.)

MASTOID DISEASE. (See also EAR DISEASE, INTRACRANIAL COMPLICATIONS OF.)

John S. Fraser, M.B., F.R.C.S.

Stereo-radiography of the Mastoid.—Bigelow¹ states that the mastoid radiogram has come to be recognized as the otologist's 'best consultant', but it requires a considerable degree of technical perfection. If radiography has any diagnostic value whatever, it is in determining what is going on inside a mastoid previous to operation. Therefore, instead of the slogan, "When in doubt, operate", he suggests this variation, "When in doubt, radiograph; if still in doubt, operate". To ascertain the size, distribution, and approximate number of the mastoid cells and the location of the sinus, the radiogram is the *sine qua non*. Plates are generally taken in two projections: (1) In the anteroposterior view; each mastoid is exposed separately on one-half of a plate with the same technique, and with a very small cone, so that the greatest possible definition is obtained. (2) The finer details of structure and topography can only be seen on the lateral-oblique plates. These are taken with the central ray passing through the vertex of the skull at such an angle as to project only the mastoid on the under side on to the plate. The exact distribution of pneumatic cells and diploe, the exact relations of the sinus, can only be obtained by the study of stereoscopic plates of each mastoid. If x-ray examination shows the mastoid to be infantile, the observer is thereby informed that mastoid symptoms may not appear or may be very indefinite, and that the middle-ear infection is quite likely to become chronic. Bigelow holds that the surgeon should therefore carry out early drainage of the antrum regardless of the absence of the classical indications.

Local Anæsthesia and the Mastoid Operation.—During the epidemic of influenza in military hospitals, U.S.A., the presence of atmospheric infection and the frequent co-existence of active pneumonia presented many risks in major operations under protracted anæsthesia. Practically all the operative work at Camp Dodge Base Hospital was therefore accomplished under local anæsthetics. Goldstein² reports a series of 20 acute mastoidectomies successfully performed under local anæsthesia, with a minimum of pain and risk, and 100 per cent recovery. The Schleich anæsthesia depends almost entirely on diffuse pressure on the nerve end-organs, and not on the character or strength of anæsthetic used. Anæsthesia can be produced by plain sterile water. In most of the cases the soft tissues were already infiltrated and oedematous. This offered an additional obstacle to the effectiveness of a local anæsthesia, but was overcome by increasing the quantity of solution used.

Technique: Goldstein uses a 10-c.c. all-metal syringe and plunger, and a needle 2½ in. long and of fair lumen, and says that the most satisfactory solution is "one half of one per cent novocain in distilled water, to which may be added 1 to 10,000 solution of adrenalin in equal parts" (*sic*). This is sterilized by boiling shortly before operation. With a standard syringe and needle, Goldstein first makes a subcutaneous injection in the zygomatic line, working towards the tip. The deep injections are then undertaken with the heavier metal syringe. By a slight rotary motion the needle is worked

between the periost and the bone. In the injection at the tip the needle is directed upward. The classical incision is now made, cutting in one sweep from the zygomatic line to the tip, and to the bone. Before elevating the periosteum, a pledget of cotton soaked in 10 per cent cocaine is placed in the wound for four or five minutes. The one difficult area to anesthetize is the posterior wall of the auditory canal and the middle-ear cavity proper. To accomplish this, the large injection needle is passed to the depth of the mastoid incision between the periost and the bone, and carried to the fundus of the canal as far as possible. Two or three cubic centimetres of solution are delivered at this point. For the radical operation, further injections are necessary.

Laboratory Examinations in Otolaryngology.—Seymour Oppenheimer and Spencer³ point out that laboratory examination as an aid in otolaryngology is given much less attention than it deserves. *Urine* examination is now considered a routine procedure. In small children with an acute otitis and a high temperature, the question may arise as to the necessity of a mastoid operation. A careful urinary examination may disclose a pyelitis. In a mastoid of not very acute type, laboratory control of the results of dieting and medication determine the most advisable moment to undertake operation. Acetonuria may follow anaesthesia. It may indicate an acidosis so grave that it accounts for symptoms, or contra-indicates further operative interference for the time. *Renal functional tests*: Oppenheimer and Spencer call special attention to two tests—blood urea and phenolsulphonephthalein. Their use is indicated wherever the urine examination or history presents any suspicion of nephritis or diabetes. The blood-chemical test indicates the grade of kidney injury or the working capacity of the kidney, while the phenolsulphonephthalein test gives only the function of the moment. These tests can now be carried out complete on 10 c.c. of oxalated blood by a very recent method devised by Folin and Wu. The tests should be done only by a well-trained chemist, and are exact and relatively simple. *Blood*: The importance of determining the coagulation and bleeding-time concerns those cases where there is any suspicion of the existence of hæmophilia or purpura. The value of the blood-count is well proved. Both the total and differential estimates of the white blood-cells are valuable. In a mastoid under suspicion, a progressive polynuclear count may prove to be the determining factor in advising operation. *Spinal fluid*: The cytological examination should never be omitted. The test for reducing substances is of some aid as indicating whether an inflammatory process exists, though localized meningitis and abscess may give a negative fluid. High pressure of the fluid is important. The finding of organisms is conclusive evidence. Normally, 6 to 8 cells per cubic millimetre are found, almost all of the mononuclear type. Suppurative conditions yield a polynucleosis. Increased lymphocytes suggest tuberculosis, poliomyelitis, or lues. Brain tumours and abscesses frequently cause only an increase in pressure. *Bacteriological examinations*: Smears demand more care and attention than are ordinarily given. The Gram stain may show: (1) The type of predominating organism, where in culture the organism might be swamped by faster growing varieties; (2) Phagocytosis of a given organism, thus indicating the one for which a vaccine should be prepared. *Cultures*: Bacteriæmia, which is rare in other bone diseases, is not so with mastoid conditions, but has not been seen unless a complicating sinus thrombosis existed. Oppenheimer advises operation in the presence of a positive blood-culture, especially if of the streptococcus group. In five cases, in which the otitic condition had been somewhat lost sight of in the presence of an acute polyarthritides, blood-cultures were positive and a sinus thrombosis was found. The

detection of a bacteriæmia should be possible in every case of sinus thrombosis at some time during the course of the disease. Following a mastoid operation, where a sinus thrombosis is suspected but where symptoms are not sufficiently definite to warrant opening the sinus and a blood culture has given negative results, it is most essential that subsequent cultures be taken. Where the sigmoid sinus has been attacked but the jugular vein has not been ligated, the persistence of a positive blood-culture is an imperative indication for ligation. In 150 cases of sinus thrombosis, Oppenheimer and Spencer have never observed an infection due to any organism other than the *Str. mucosus*.

Mastoiditis and Tonsillitis.—MacNaughton and Swift¹ have found that the tonsil plays an important part in infections of the streptococcic type, and post-mortem findings indicate that mastoiditis is not always due to direct extension from the nose and pharynx by way of the Eustachian tube. The tonsil is the usual seat of infection of the blood-stream. Otitic meningitis is a rare complication, while general meningitis may occur with, but independent of, the mastoid infection. The authors arrive at the following conclusions: The most reliable diagnostic symptom of mastoiditis is the persistent headache. Other infections, such as pneumonia, meningitis, and toxic joints, frequently occur at the same time. **Carrel-Dakin Solution and Dichlorazine Paste** are of great benefit in the after-treatment. **Serum Treatment** is of no avail when the radiograms show involvement of the cells, but is of great benefit when a septic temperature follows operation. All patients with blood-stream streptococcus infection should be given antistreptococcus serum intravenously for several days after operation. It is best given in 25-c.c. doses every three or four days. There is little reaction, and the resultant fall in temperature is remarkable.

Symptomless Influenzal Mastoiditis.—Muecke and Grantham-Hill² state that the possibility of the occurrence of a very acute mastoiditis with few, if any, of the usual symptoms, was first brought to notice by several cases in which the original condition was deduced by tracing back the undoubted steps of development of the complication which was the first recognizable feature. The sequelæ were lateral sinus thrombosis, perisinus abscess, and extradural abscess, all three appearing unexpectedly without any of the usual signs or symptoms of mastoiditis.

The cases displayed the following noteworthy features: (1) A very acute onset of earache occurring in the second or third day of a mild influenzal attack comprising pyrexia, malaise, coryza, and pains in the trunk and limbs; (2) The upper part of the drum was generally alone affected, displaying redness and bulging from the beginning; (3) Perforation occurred early, followed by unusual hæmorrhage lasting for several days, accompanied by complete relief of all pain; (4) The posterior meatal wall became red and swollen shortly after the appearance of the discharge; (5) The discharge, at first slight, became in the second or third day profuse, coinciding probably with mastoid suppuration; (6) After perforation, other than discharge, there were no symptoms—that is to say, no pain, pyrexia, increase of pulse-rate, mastoid tenderness, or malaise; (7) On opening the mastoid, which was invariably of the pneumatic type, the chisel exposed softened, red, marrow-like bone, which showed early necrosis and absorption, with the formation of large cavities full of pus—the extension was generally downwards and backwards; (8) The incomplete operation was performed in all cases, although in several the so-called 'bridge' had already suffered necrosis; (9) The subsequent progress was unusually rapid and uneventful, and in no case has the hearing been appreciably affected; (10) In all cases streptococci of the hæmolytic influenzal type were found in large numbers.

The writers particularly wish to emphasize the fact that after perforation the patients were apparently proceeding satisfactorily until one or other of

the dangerous sequelæ arose. They have classified their cases into three categories: (a) Cases not recognized until the occurrence of dangerous sequelæ; (b) Cases seen shortly after the appearance of the discharge; (c) Cases followed from the onset. They have little hesitation in believing that if the cases in class (c) had not been treated when they were, they would have run the grave risk of following the same course as those in class (a). The writers are impressed with the importance of early mastoidectomy.

Jacques and Daure⁶ state that a large proportion of post-influenzal cases have been notable for the formation of remote abscesses in the fascial planes of the neck—not as in Bezold's type, but far back towards the ligamentum nuchæ. Such septic foci may be multiple, appearing at intervals one after the other. The signs and symptoms referable to the ear itself may be trivial; but the remote sequelæ above referred to may be serious and protracted.

Incomplete Mastoid Operation as a Cause of Delayed Healing.—F. T. Hill⁷ states that out of a series of 168 simple mastoid operations, there were 16 cases which came to secondary operation. Of these, 2 were of the pneumatic type, 5 diploetic, and 9 diplopneumatic. The aural surgeon should not consider his operation complete until he has followed out every cell. In the diploetic and diplopneumatic types, the operator, upon reaching what he feels is sound bone, is apt to consider discretion the better part of valour, and stop before completely exenterating the mastoid. Hill finds that in about 12 per cent of cases re-operation is necessary. Unless the mastoid is completely cleaned out, we may have a condition simulating a chronic osteomyelitis. Too many mastoid operations may be likened to sweeping a room without touching the corners. The zygoma, the cells or diploe just posterior to the external auditory meatus, the tip, and the angles between the sinus and the floor of the middle fossa and the sinus and the digastric groove, should be as thoroughly exenterated as possible. One case at the second operation showed an area of necrotic dura in the angle between the sinus and the middle fossa; meningitis developed and death ensued; post-mortem examination revealed a temporo-sphenoidal abscess. Three cases developed sinus thrombosis; perisinus abscess was found in each case. In no case where the mastoid was completely exenterated was secondary operation required.

Hæmorrhage after Mastoidectomy in Purpuric Patient.—Harris⁸ records a case of severe and uncontrollable hæmorrhage following mastoidectomy in a patient suffering from purpura. The patient had bilateral acute middle-ear suppuration, for which the membrane was incised early. There was a family history of hæmophilia, and a personal history of recent arthritis and numerous subcutaneous hæmorrhages. Every effort was made to avoid operative interference. The operation followed transfusion, which was repeated the following day. There was no unusual bleeding during the operation, but subsequently there was oozing, which was controlled by 5 per cent coagulen ciba. Considerable bleeding occurred during the next few days, which necessitated suturing the wound. Even the transfusion wound bled as late as a week after the operation. The bleeding stopped after seventeen days and the wound looked normal. Recovery from the aural trouble was slow but complete. The patient, however, died soon afterwards.

Mastoiditis and Suboccipital Pott's Disease.—Portmann⁹ states that, since the treatment of mastoiditis and of Pott's disease are so widely different, diagnostic errors in this field are exceedingly serious and result in dire consequences to the patient. He discusses in detail the more important symptoms of the two diseases which aid in establishing a diagnosis. (1) *If there is no cervical abscess:* The pain in Pott's disease is accentuated by movements of the head; in mastoiditis by pressure in the region of the antrum. In the former there

is early and marked stiffness of the neck; in mastoiditis this is absent or not pronounced. In Pott's disease there are no ear symptoms, as in mastoiditis. In Pott's disease the general condition is bad, and often there are lesions of other organs. (2) *In the presence of a cervical abscess*: The pain in the region of the abscess is slight in Pott's disease, but severe in mastoiditis. In the former the abscess is regular, not inflamed, without peripheral oedema; in mastoiditis the abscess is not sharply defined, has peripheral infiltration and inflammatory reaction. In Pott's disease puncture of the abscess releases a thin, serous, lumpy pus which may contain tubercle bacilli; in mastoiditis the pus is thick and of uniform consistency, with no evidence of tuberculosis. (3) *Fistulæ*, if present, will in Pott's disease show purplish disconnected borders, with occasional fungosities; in mastoiditis the borders will be regular and red. (4) *Röntgenoscopy* will disclose lesions of the cervical vertebrae in Pott's disease, but none in mastoiditis. (5) In Pott's disease a probe introduced in the fistulous tract will point toward the cervical column; in mastoiditis toward the mastoid.

Eye Sign in Mastoiditis.—Onate¹⁰ comments on the importance of hyperæmia of the papilla as a sign of cerebral complications during mastoiditis. It is particularly instructive when the mastoid process is deceptively free from symptoms. Even with a pronounced clinical picture of mastoiditis, involvement of the brain may escape notice unless the fundus of the eye is examined as a routine measure. Hyperæmia of the papilla calls for immediate operation without wasting time on ice-bags, etc. Craniotomy followed by the mastoid operation will save many otherwise doomed patients. In two recent cases this eye sign gave the clue that led to a prompt cure after trephining had confirmed the extradural abscess.

Mastoid Disease Simulated by Chloroma and Malignant Tumour.—Catherine Lewis¹¹ records the case of a male, age 10, with pain in and discharge from the right ear, tender swelling over the right mastoid, enlargement of right upper cervical glands, and right facial paralysis. A diagnosis of tuberculous mastoiditis was made. The antrum contained pus and *greenish-looking granulation tissue*. Improvement followed for a week, when retention of urine and constipation appeared. Blood-count showed lymphatic leukemia. Later, epistaxis, pain in dorsal spine, and left facial paralysis developed. The inguinal glands became enlarged, and paralysis developed. The temperature fluctuated, and death occurred seven weeks after the apparent onset of the disease. Autopsy showed masses of growth in the skeleton and internal organs.

Calabresi¹² reports a primary *fibromyxo-angio-epithelioma of the middle ear* in a child of three. The chief symptom was hemorrhage from the ear, and the case was at first mistaken for otitis media with granulations. Facial paralysis and a large mastoid swelling occurred. A radical mastoid operation was performed, but repeated removals became necessary, and the child died of cachexia. The author suggests that the growth arose from the embryonic myxomatous tissue that fills the middle ear at birth.

REFERENCES.—¹*Trans. Amer. Otol. Soc.* 1918, xiv, pt. iii, 543; ²*Laryngoscope*, 1919, xxix, 559; ³*Ann. of Otol. Rhinol. and Laryngol.* 1919, xxviii, 1012; ⁴*Surg. Gynecol. and Obst.* (abstr.) 1920, May, 409; ⁵*Lancet*, 1920, ii, 241; ⁶*Rev. de Laryngol. d'Otol. et de Rhinol.* 1919, Aug. 31; ⁷*Laryngoscope*, 1920, xxx, 154; ⁸*N. Y. Med. Jour.* 1919, Aug. 23; ⁹*Rev. de Chir.* 1919, xxxviii, nos. 11, 12, 916; ¹⁰*Jour. Amer. Med. Assoc.* 1919, Nov. 15, 1563; ¹¹*Lancet*, 1919, ii, 850; ¹²*L'Ospedale Maggiore*, 1919, Feb. 28.

MATERNITY AND CHILD WELFARE.

Joseph Priestley, M.D., D.P.H.

Nothing new has been advanced during the past year in regard to maternity and child welfare. Most authorities are simply marking time—organizing and developing their various maternity and child-welfare schemes, and seeing how

best and most economically they can administer the Milk Order—an Order that is doing an immense amount of good, but, naturally, involving a large expenditure in those districts (large towns) where the Order is being energetically administered. The estimates for some districts for the coming year are as much as £10,000 to £30,000, with the natural result that the Ministry of Health is tightening up the administrative curb and requiring strict financial control by the officers of the sanitary authorities with a view to reducing 'leakages' or 'undeserving cases' to a minimum. This is only right, but care must be taken to prevent injustice to genuine cases. It is better to have a leakage of (say) 10 per cent of undeserving cases than that the remaining 90 per cent of deserving cases should lose the inestimable benefits of the Order, which provides for milk, free and at reduced rates, for mothers (expectant or nursing) and for children under 5 years of age—the milk to be ordered by medical certification only, and in the quantities allowed under the Order. Verification of incomes seems to be the crux. Is it necessary, or advisable, in all cases to write or apply to employers to verify incomes of applicants? Will not such a hard-and-fast rule weaken the *voluntary* aspect of maternity and child-welfare work, and tend to officialize it—to Prussianize it, in short? It will be a sad day for England when the *voluntary* aspect of public health work ceases. It behoves the Ministry of Health to tread carefully lest any action on its part may seem to point to bureaucratic administration, and (what is worse) may lead to such. What would become of "enlightened public opinion", to which the Chief Medical Officer of the Ministry attaches so much importance, as one of the factors necessary to any great advance in the national health? Voluntary versus official administration will come up for sharp discussion in the near future, having regard to the greater interest labour is now taking in municipal administration and control. Labour's idea (speaking generally) is control by the people, of the people, for the people, and this doctrine must lead eventually to nationalization and municipalization of everything administrative. What is really wanted is to encourage voluntary effort, with co-ordination and strict supervision by the municipal authorities, so as to secure uniformity, as well as a high standard, of administration. Time will show.

Meanwhile, the democratic wave advances. It is the sacred right of children to be as healthy as knowledge can make them. For them milk is a vital food. The health of the child is the power of the nation. What America can do with 'nutrition classes', England can do, and nothing that is likely to interfere with the *generous* administration of the Milk Order should be entertained by health authorities. The Milk Order is, undoubtedly, one of the best measures ever introduced by any government, not only in its practical or actual value, but also educationally. But there is milk—and milk. Generally speaking, the milk supply is far away from the *ideal*, and pasteurization remains, consequently, necessary still. America has proved that fact by showing that pasteurized milk (delivered in sealed glass jars or bottles) saves babies' lives by eliminating domestic or home infection or contamination of milk (the chief cause of diarrhoeal or enteric troubles in those partaking of it, especially children). Pasteurization alone is not sufficient: delivery in sealed glass jars or bottles is also necessary. Raise the sanitary status of farms, insist upon grooming of cows (tuberculin-tested cows), arrange for 'certified' and 'graded' milks for those who can afford to pay, do all such things to improve the milk supply; but do not forget the ever-present and deadly danger of home contamination—especially in poor homes and mean streets and courts and alleys. The lives of babies and children must be saved at any cost.

MEASLES.

J. D. Rolleston, M.D.

BACTERIOLOGY.—A. W. Sellards and E. Sturm¹ examined 31 cases of measles occurring a few weeks after an epidemic of influenza, and found an organism indistinguishable from the Pfeiffer bacillus in 25 cases. The organism was obtained readily from the sputum, and with little difficulty from the conjunctivæ, but was not found in the blood or excised skin lesions. It rapidly disappeared in about three-fourths of the cases as the acute symptoms of measles subsided. Inoculation with the organism of four healthy volunteers who were supposed not to have had measles was negative. The writers consider that the occurrence of the Pfeiffer bacillus both in influenza and in measles is evidence against its etiological relationship to either disease; but they regard the available evidence as not at present sufficient to exclude the specific etiological rôle of the Pfeiffer bacillus in some of the acute respiratory diseases.

SYMPTOMS.—H. V. O'Shea² reports a case of *hæmorrhagic measles* in a boy, age 5, which was characterized by extensive cutaneous hæmorrhages, severe hæmoptysis, subconjunctival hæmorrhages, and signs suggesting hæmopericardium, associated with a comatose state. Contrary to the usual issue, recovery took place.

H. W. Berg³ distinguishes hyperpigmented from hæmorrhagic measles. Whereas hæmorrhagic measles is an extremely fatal disease accompanied by hæmorrhages from the mucous membranes and severe constitutional disturbance, in hyperpigmented measles the prognosis is very much better than in ordinary measles. The hyperpigmented eruption is much more brilliantly red than that of ordinary measles, the papules are more raised, and the macular portion of the eruption is almost as red as the papular. The desquamation is delayed, and the scabs are larger and coarser than in ordinary measles. There are no petechiæ or purpuric spots and no hæmorrhages from the mucous membranes as in ordinary hæmorrhagic measles.

A fatal case of *bullous eruption* complicating measles is reported by F. C. Neff⁴ in a girl 6 years old. The bullæ began to appear in the first twenty-four hours of the measles rash, and developed in various parts of the body. The measles eruption was not more pronounced than usual, and there were no petechiæ. The temperature remained high throughout. Pneumonia may have been present, but examination of the chest was impossible owing to the condition of the skin, and an autopsy was refused. Similar cases of this rare complication have been recorded by Steiner, Henoch, Baginsky, and others.

Nervous complications in measles are rare (see MEDICAL ANNUAL, 1908, p. 372). They occur much more frequently in children than in adults, and in convalescence than during the febrile period. A. L. Skoog⁵ reports an example of *cerebellar involvement* in a girl, age 4, characterized by ataxic movements of all the extremities, and ending in recovery after seven weeks; also a case of *meningo-encephalitis* in a girl of the same age, which would probably be followed by imbecility and possibly epilepsy.

A. W. Sellards⁶ refers to the previous *inoculation* experiments on monkeys by Wentworth and himself (see MEDICAL ANNUAL, 1920, p. 228), and which showed that the reactions following intensive inoculation were too indefinite to allow the practical use of monkeys in testing the blood of patients for the virus of measles. He now relates a further experiment in which he injected blood from two early cases of measles in the pre-eruptive stage subcutaneously and intraperitoneally into two monkeys. One animal developed moderate leucopenia and, later, a slight rash, and a specimen of its blood was injected into a susceptible human volunteer, but produced no symptoms. Normal serum injected into monkeys was followed by a very slight erythema about

eight to ten days after injection in 4 out of 8 animals, so that Sellards concludes that the weight of evidence is against the symptoms in the monkey being regarded as a reaction to the virus of measles. In another series of experiments Sellards⁷ inoculated eight apparently susceptible volunteers in various ways—viz., subcutaneously, intramuscularly, or in the mucous membranes—from patients in the eruptive or pre-eruptive stage, but failed to produce the disease. He points out, however, that failure to transmit measles does not preclude the existence of the measles virus in the blood-stream. The possibility of active immunity having been produced was suggested by exposure to the natural infection of measles failing to produce the disease.

DIAGNOSIS.—J. Brownlee⁸ considers that for administrative purposes only two symptoms are of the smallest use for the early diagnosis of measles—viz., evening rise of temperature, and œdema of the palpebral conjunctiva, especially of the lower lid. By the time that Koplik's spots have appeared he considers that the mischief has been done.

PROPHYLAXIS.—J. Brownlee⁹ considers that a very large proportion of children who contract measles are infected by older brothers or sisters who are attending school. As very few children develop the first symptoms of measles within the first seven days of infection, the child may be allowed to stay at home for seven days after exposure, but during the next seven days should live with its grandmother or other relation who has no children or whose children have already had an attack of measles.

Degkwitz¹⁰ injected young children with 7 to 22 c.c. of *Convalescents' Serum* when another child in the same family or ward developed measles, and none of the injected children showed any signs of measles, although continuing in contact with the measles child, whereas many of the uninjected children contracted the disease.

TREATMENT.—E. Terrien¹¹ reports a case of malignant measles in a male infant, age 13 months, successfully treated by subcutaneous injection of 20 c.c. of *Whole Blood* taken from his brother who had had measles six months previously. Terrien points out that previous examination of the donor's blood may be unnecessary, as accidents are chiefly caused by hæmolysis, which is unlikely to occur on using the blood of the patient's brother, father, or mother.

REFERENCES.—¹*Johns Hop. Hosp. Bull.* 1919, 331; ²*Practitioner*, 1919, ii, 460; ³*Med. Record*, 1920, i, 161; ⁴*Amer. Jour. Dis. Child.* 1920, i, 469; ⁵*Jour. Amer. Med. Assoc.* 1920, i, 1697; ⁶*Johns Hop. Hosp. Bull.* 1919, 311; ⁷*Ibid.* 257; ⁸*Brit. Med. Jour.* 1920, i, 534; ⁹*Ibid.*; ¹⁰*Jour. Amer. Med. Assoc.* 1920, ii, 356; ¹¹*Bull. Soc. méd. Hôp. de Paris*, 1919, 1134.

MELANCHOLIA, INVOLUTIONAL.

Bedford Pierce, M.D., F.R.C.P.

Marguerite Wilson, M.B., Ch.B.

In Menzies¹ presidential address on "The Mechanism of Involutionary Melancholia" there is no lack of clear expression of opinion, and in the opening sentences we find it stated that "the psychology of melancholia is the depressive emotion, the anatomy of the depressive emotion is a sympathetico-tonus, and the chemistry of a sympathetico-tonus is an endogenous anoxæmia". The importance of enterostasis with excessive putrefaction, producing many of the physical symptoms of melancholia, is explained—such symptoms, e.g., as asthenia, anorexia, nausea, headaches, loss of weight, torpor, and apathy—whilst it is stated that in all probability most visceral delusions are founded upon abdominal discomfort. The existence of adhesions, the earliest of which form round the cæcum and lower end of the ileum, has much to do with the development of enterostasis, and following this there is elongation and dilatation of the bowel which may extend to the duodenum. The contents of the small intestine are dammed back. The origin of these adhesions is obscure,

and the opinion of various authors is quoted: Lane that they are evolutionary, not inflammatory, while Keith believes that enterostasis is associated with nodal segments throughout the intestine. Menzies suggests that both may be right, and that the condition begins with a neuro-hormonic disturbance and is afterwards kept up by secondary mechanical defects.

Attention is drawn to the reciprocal action of hormone secretion and the nervous system—especially the autonomic and sympathetic system—the recent work on the physiology of the adrenals, and the glycogenic function of the liver. A physiological explanation of the presence of glycosuria in melancholic patients is attempted. Kooy is quoted as demonstrating an excess of blood-sugar in these patients before as well as after a meal.

A careful description is given of the nervous mechanisms which are involved during the passage of an emotion. It is stated that the shortest latent period of an emotion is 0.75 sec., and is much longer than a reflex act, and Menzies maintains that a motor-sensory complex causes the emotion, and not the converse.

The well-known physical signs of melancholia—furred tongue, anorexia, constipation—are said to be due to sympatheticotonus, whilst the depression is invariably second to enterostasis, and this in turn arises from enterospasm or is produced mechanically. Menzies supports the doctrine of the vicious circle—"enterospasm leads to bacteriolytic absorption, and this to defective cerebral control, which brings on sympatheticotonus and increased enterospasm, and the result is depression". Associated with it is hyperadrenalism and hyperglycaemia. These basis facts are said to be established, for their presence in a state of fear has been observed by many workers; and a state of depression is a state of persistent fear, and it is essentially a defensive reaction.

He further claims that in depressed states there is a general condition of anoxaemia due to a failure of haemocytes to carry sufficient oxygen to the tissues, but admits that little proof is forthcoming. Two experimental methods have been tried. In one case temporary benefit was produced by intravenous injection of hydrogen peroxide; but the treatment sometimes produces collapse and other alarming symptoms. Large doses of adrenalin produced temporary exaltation, but no permanent good was done.

In an elaborate review of present-day knowledge of the anatomy and physiology of the cerebral cortex, it is pleasant to find a generous acknowledgement of the work of Bevan Lewis in 1878, who first correlated histological structure with function. Interpolated between physiological discussions are frequently found interesting clinical statements—e.g.: "Stuporose patients can be temporarily awaked to mental activity by a prolonged bath at 110° F., although the stupor becomes as deep as ever within half an hour of removal." "I used to recommend trephining over the seat of cranial wounds where the commotio cerebri resulted in melancholia, generally with satisfactory results. It then became evident that the improvement had nothing to do with any fracture or site, and was entirely the result of altered intracranial conditions." "No one ever saw a patient die of non-specific dementia, however much the liability to intercurrent disease is increased."

Menzies is by no means hostile to psychotherapy. He admits the existence of the unconscious memory, and states that it is a most potent factor "in weakening the normal psychical control over the thalamus". The value of psychotherapy is in opening up round-about association paths in the cortex; but it is useless when attention is seriously diminished, as in states of excitement, confusion, and stupor. In depression, however, and cases of defective will-power, "psychotherapy is of the greatest value in shortening treatment

and preventing chronicity, both on account of the increased cortical oxidation which mental effort tends to produce, and because in psycho-analysis the closest attention is necessarily paid to bodily symptoms and their treatment".

The relation of involutionary melancholia to tissue change is expressed in the following isolated sentences: "Involution is a march of gradually increasing cytolysis . . . and depends to quite an appreciable extent upon the power of reaction of the hepatic antitoxins to the intestinal toxins, the penalty of failure being defective oxidation. What we call melancholia depends upon modifications of the same process, and especially on excessive bacterial fermentation and enterostasis. In response to this sub-oxidation a sympatheticonus occurs, the sensorimotor resultant of which is the depressive emotion. . . . It is curious that by a system of inductive reasoning we arrive at the same point from which the ancient physicians started centuries ago, and ascribe melancholia to the influence of a deranged liver."

Edward J. Kempf² attempts to bring into relation recent neurological research and the doctrines of the Freudian psycho-analysis. The value of the conclusions reached can be judged by the following quotation: "Through survival of the fittest, man's autonomic apparatus acts according to a definite inherent law, namely, that whenever any segments of the autonomic-affective apparatus are forced into a state of hypertension through metabolism, or endogenous or exogenous stimuli, they compel the projicient apparatus to so adjust the exteroceptors in the environment as to acquire the stimuli that have the capacity to produce comfortable postural readjustments in those particular segments of the autonomic apparatus." Those who value clear thought expressed in beautiful English will no doubt hasten to read every word of the original article.

D. K. Henderson³ considers that the anxiety states which occur during the involutionary period can be distinguished from the depressed phase of manic-depressive insanity on the one hand and the consequences of cerebral arteriosclerosis on the other. In manic-depressive cases the depression is generally of the sad, slow variety, with a subjective feeling of difficulty of thinking, whilst in cerebral disease from arteriosclerosis there will probably be vertigo, headache, convulsive attacks, and loss of memory. He considers the recognition of an anxiety psychosis important, as frequently it is amenable to treatment.

This disorder is common. In five years at the Glasgow Royal Asylum, out of 299 patients admitted between forty and seventy years of age, 77 were suffering from anxiety states, 38 were manic-depressives, and 92 had organic brain disease. Of the anxiety cases about 58 per cent recovered or definitely improved, so the prognosis was comparatively favourable.

In the greater number of the anxiety cases definite mental factors of causation could be assigned. The history of the cases generally shows some failure of adaptation to new conditions, due in part to loss of elasticity and vigour, and the decline of the bodily powers. Trifles and worries which formerly could easily have been overcome now seem overwhelming, the misdemeanours of the past assume tremendous proportions, and the carefully repressed instincts and strivings no longer can be ignored. The conflict of instinct is expressed in anxiety, fear, insomnia, and delusions, and possibly suicidal tendencies develop. Anxiety states are usually more severe than depression in manic-depressive insanity after forty years of age. There is greater danger of death through the severity of the disorder, and when there are relapses they are usually true to type, and attacks of excitement with euphoria do not occur.

Henderson considers that this anxiety psychosis is essentially akin to the anxiety neurosis of Freud, but the conduct of the patient is less under control.

The climacteric is considered to lower the individual resistance, and submerged repressed tendencies come to the surface. It is not easy for such patients to unburden their minds, and they are generally quite unaware of the connection between the repressive and the anxiety symptoms. Henderson relates several cases showing how symptoms arise and the importance of trying to fathom the patient's real difficulties. "It is these anxious, uneasy, fretful patients who are always so ready to explain their troubles on the basis of their environment, and who never seem to realize that they are themselves at fault. They cannot admit the actual situation, and hang their anxiety on any peg that offers." This view of involutional melancholia gives the physician greater personal interest in a very distressing group of cases. "It is quite possible in most cases of the anxiety-reaction type to give the patient a general explanation in regard to how such attacks often originate from factors which he or she has been unable to meet adequately," and therefore it is important to discuss the whole life-history. "The physician cannot do more than put his point of view before the patient, and then the matter must be left to the patient's judgement as to whether it is to be accepted or rejected. If it is accepted, then whatever the patient offers spontaneously should be utilized vigorously, but such a method of treatment should not be forced arbitrarily. If it is rejected, then the best possible compromise should be attempted."

Kooy⁴ advances the hypothesis of hypersecretion of suprarenal extract in cases of melancholia. He bases his theory on the work of other observers as well as his own. (W. B. Cannon puts forward the theory that psychical disturbances cause liberation of the extract through impulses carried by the splanchnics. Other workers have found glycosuria in 67 per cent of melancholics.) Excess of the extract results first, in excess of sugar in the blood, and then glycosuria. Other symptoms are raised blood-pressure, rapid pulse, dilated pupils, and erection of hairs. The psychical disturbances which act as stimuli are fear and anger. Hyperglycæmia is therefore to be expected, and has been found in melancholia (especially after food and during excitement), and in mania (not in mild, cheerful cases). It is absent in epilepsy, dementia præcox, and amentia, unless during excitement.

REFERENCES.—¹*Jour. of Ment. Sci.* 1920, Oct., 355; ²*Jour. Nerv. and Ment. Dis.* 1920, Jan., 7; ³*Jour. of Ment. Sci.* 1920, July, 274; ⁴*Brit. Med. Jour.* 1920, i, 193.

MENINGITIS SECONDARY TO EAR DISEASE. (See EAR DISEASE.)

MENINGITIS, SEROUS SPINAL.

J. Ramsay Hunt, M.D.

F. M. R. Walshe¹ gives a review of this subject. Under such names as 'meningitis spinalis serosa', 'arachnitis adhæsiva circumscripta', 'arachnoidite cloisonnée', and 'chronic spinal meningitis', there have appeared during the last twenty years accounts of a condition, clinically resembling the symptom-complex of spinal tumour, associated with the presence of adhesions between the spinal theca and the arachnoid, with damming up under pressure and even encystment of the cerebrospinal fluid, which have resulted in the production of medullary compression and paraplegia. The earliest description is that of Schlesinger (1898), who described a localized hydrops of the spinal meninges, which produced a picture of compression of the cord. An important contribution to the subject is that of Mauss and Kruger, who describe a series of twenty-three cases which came to operation.

ETIOLOGY.—In all the origin was traumatic.

NATURE OF THE LESION.—At operation the theca at the level of the lesion was found to be covered by a fine, easily separated membrane consisting of old partially organized clot and recent hæmorrhages; the dura itself showed

thickenings of inflammatory character. On incising the theca, the characteristic and essential lesion was revealed. Strands of fine translucent membrane arising from the arachnoid passed across the space between the dura and cord, fixing the latter, matting the roots, and sometimes dragging the cord laterally. In some instances these processes formed a transverse partition damming up cerebrospinal fluid above their level, or formed loculi filled with fluid. On incising the dura it was invariably found that cerebrospinal fluid escaped under great pressure, and the arachnoid bellied out through the incision like a cyst until incision allowed the escape of fluid. A remarkable vascularity characterized these newly-formed membranous processes; coils of tortuous vessels coursed in their substance. The contained blood of these was always purple in colour, suggesting venous obstruction and general interference with the vascular supply of the cord. The freeing of the cord, and division and removal of the proliferated material, produced at once a visible return to more normal vascular conditions; the distention of the vessels abated, and their contained blood resumed its normal colour. In more severe cases the dura and cord were bound tightly together, and the subarachnoid was completely obliterated at the site of the lesion.

SYMPTOMATOLOGY.—Root symptoms predominated, and signs of defective conduction in the cord were sometimes absent and usually slight.

Irritative Sensory Phenomena.—Root pains, paræsthesiæ, and hyperæsthesia were prominent symptoms in all cases, and corresponded in extent with the area of objective sensory change. They were radicular in distribution, and included the cutaneous territory of several roots, and seem not to have been uniradicular. A uniradicular zone of hyperæsthesia at the upper level of the lesion was never seen. The pain and hyperæsthesia were in many cases intense and rendered the patient helpless, quite apart from any true loss of power.

Irritative Motor Phenomena.—These were not less in evidence. They were also of multiradicular type. Many cases showed a tendency to spontaneous or readily elicited reflex movements within the distribution of certain roots; such reflex movements of the lower limbs were worse at night, and were a source of considerable discomfort to the patient. Widespread twitching and fibrillation of muscles within the affected area were also seen.

Root-defect symptoms were also present, and predominated over cord-defect symptoms. Sensory loss was usually unilateral in limb segments and bilateral in trunk segments, when they predominated on one side. Sensory loss was not dissociated, nor complete, and affected all modes of cutaneous sensibility equally in degree and extent. It was multiradicular. Motor disturbance of the same topography as the sensory defects was common; in a limb, atrophic paralysis of muscles, with corresponding electrical changes, was the usual condition; in the case of trunk muscles atrophic paralysis was not so often or so definitely observed.

Vasomotor, secretory, and trophic disturbances over the affected root area were seen, and resembled those in any peripheral-nerve or plexus injury.

Local sweating was a striking phenomenon. Pure spinal symptoms were seen in several cases. A Brown-Séquard syndrome was once observed. There were marked spinal symptoms in five cases only—spastic paresis and sensory loss, with the corresponding reflex alterations.

Variations in symptoms formed a characteristic feature of the cases. Outbursts of pain, and motor irritative and sympathetic irritative phenomena, occurred from time to time. Similarly, in cervical lesions, the sudden appearance of bulbar symptoms, dyspnœa, nystagmus, facial palsy, and difficulty in head movement provided an alarming crisis.

DIAGNOSIS.—In differentiating these cases from cases of actual cord damage, stress is laid on the following features: (1) Variability of symptoms; (2) The isolated occurrence of root and segment symptoms; (3) The frequency of irritative phenomena; (4) The multiradicular distribution of the symptoms.

TREATMENT.—This is purely surgical, and operation appears to have been followed by rapid relief and recovery. In some instances a marked exacerbation of irritative root symptoms followed operation and persisted for over a week. The end of operation is the division and removal of the proliferated and adherent arachnoid, freeing of the cord in the theca, and the re-establishment of a free cerebrospinal circulation.

REFERENCE.—¹*Med. Science*, 1919, Dec., 318.

MENINGITIS, TUBERCULOUS.

J. Ramsay Hunt, M.D.

Recovery from tuberculous meningitis after intraspinal injections of antimeningococcic serum is reported by Hollis and Pardee.¹ A careful search through medical literature from 1910 to date has resulted in finding eleven cases ending in recovery which have been definitely proved to be tuberculous, the criteria being the clinical course, the cell-count and differential of the spinal fluid, the finding of tubercle bacilli, and the demonstration of the disease in an inoculated guinea-pig; the last two being the only real proofs. To this number the authors add four cases which terminated in recovery.

TREATMENT.—There have been many suggestions for therapy in this disease, but this very multiplicity reveals their inefficacy. Among these are a legion of drugs which have been found of value in other forms of tuberculosis, forced feeding, application of leeches to the mastoid, tuberculin, and hexamethylenamine for its supposed bactericidal effect in the spinal fluid. Operation in the form of decompression and opening into the cisterna magna has been advocated, and is compared to laparotomy for the relief of peritoneal tuberculosis. Since the introduction of spinal puncture by Quincke, this procedure has come to be looked on more and more as a therapeutic as well as a diagnostic aid, so that it is now largely employed for the relief, even though temporary, of all forms of increased intracranial pressure. In the authors' experience this procedure has always been followed by relief of the symptoms, even though for a short time only, so it is their belief that spinal puncture, frequently repeated, should be considered a real asset in the treatment of this disease.

One of the writers used intraspinal injections of *Antimeningococcus Serum*, and the very satisfactory termination of this case prompted a similar procedure in the second case, with again a favourable outcome. In addition to these two cases, they report two additional ones terminating in recovery. In this series there are two which are recoveries from unquestionable tuberculous meningitis; the two remaining cases, because of the failure of positive laboratory findings, may be classed as doubtful. Against these must be balanced three cases in which the serum was used during the past four years at St. Luke's Hospital with ultimate death, making in all 7 patients treated with antimeningococcic serum, 4 of whom recovered. They do not urge this as a specific treatment, but, as a method of approach, the intraspinal injection of meningococcic serum, combined with frequent spinal drainage, constitutes a form of treatment by which the patient seems to have at least a chance.

The theoretical aspect of the therapy seems fairly well founded if we consider the very satisfactory results which have been obtained with autoserum in the treatment of other chronic meningeal disease, e.g., syphilis of the spinal cord. Many who have used the Ogilvie or Swift-Ellis technique are quite satisfied that the benefit obtained therefrom is not from the arsphenamin, but from the irritating effect of the serum introduced.

The authors consider that the intraspinal injection of antimeningococcic serum has two distinct actions: first, by adding to the spinal fluid certain antibodies which it is unable itself to develop; and second, by the introduction within the dura of a foreign protein in the form of horse serum. The irritative effect of the latter on the meninges produces a cellular response and a hyperæmia about the site of any localized tubercle, with beneficial result.

Barber² also reports the case of an adult, proved bacteriologically to have tuberculous meningitis, who made a complete recovery. Clinically the case was never doubtful. The first lumbar puncture was performed in the fourth week of the illness, to relieve symptoms of intracranial pressure; the benefit was considerable, as was also the case after the second and third punctures; and although the fourth puncture, made in the eighth week, did not seem to do any good, and the case was regarded as hopeless, he believes that but for the earlier lumbar punctures the patient would have died from increased intracranial pressure. For thirteen weeks the temperature was of an irregular intermittent or remittent type, usually reaching 102° or 103° in the evening; the pulse was irregular, but usually below 100, until the ninth or tenth week, by which time there was an extreme degree of prostration; the general condition varied between coma and delirium, with signs of distress and headache. In the twelfth and thirteenth weeks the temperature was not so high, and from the fourteenth onwards it was normal or subnormal, and the patient made a slow but steady convalescence. On her discharge in the twenty-eighth week, after having gained 18 lb. in eight weeks, she was perfectly well in every way. Her mental condition was normal, and there was no loss of memory, nor headache; the eyes were quite normal: and the limbs were strong, with no rigidity or increase of reflexes.

Specific therapy in tuberculosis is not very satisfactory at present, but most infected persons have good natural powers of recovery. Possibly repeated lumbar puncture is worthy of routine trial in cases of tuberculous meningitis.

REFERENCES.—¹*Arch. of Internal Med.* 1920, July, 49; ²*Brit. Med. Jour.* 1920, i, 601.

MENTAL DEFICIENCY.

Bedford Pierce, M.D., F.R.C.P.

Marguerite Wilson, M.D., Ch.B.

Although Terman's¹ volume on *The Measurement of Intelligence* is primarily intended for use in grading children for educational purposes, the book will be of great value to the physician interested in mental deficiency. It contains an explanation of the Stanford revision of the Binet-Simon intelligence scale, and a discussion of the difficulties of the subject. As a general rule the intelligence of backward children is overestimated, whilst that of superior children is underestimated. In both cases the children suffer; the former are constantly struggling to keep up with a class beyond their powers, whilst the latter easily acquire careless habits and often appear to the teacher as hardly equal to the average. The present series of tests have involved the examination of 2300 subjects, including 1700 normal children, 200 defective and superior children, and 400 adults. The new revision gives six tests for each year from 3 to 10, eight tests each for 12 and 14, and six tests each for the average and superior adult. Besides these, there are a number of alternative tests to be used if any of the regular ones are unsuitable.

The chief feature of Binet's work was the grading of the tests according to age, and in the main the Stanford revision has merely extended and corrected the conclusions of the Frenchman, to whom full acknowledgement is given. "Binet was the first to utilize the idea of age standards in the measurement of intelligence". His "method enables us to characterize the intelligence of a child in a far more definite way than has hitherto been possible. . . . Why

should a device so simple have waited so long for a discoverer? We do not know". Apparently the idea of an age-grade method, as this is called, did not come to Binet himself until he had experimented with intelligence tests for some fifteen years. "However the discovery was made, it ranks, perhaps, from the practical point of view, as the most important in all the history of psychology."

These tests are intended to grade the 'general intelligence', and in this they make no attempt to measure mental faculties such as memory, attention, or imagination. Nor do they give any indication of exceptional ability in any special direction, and they are of little value in suggesting educational procedure. There are also fallacies which must be guarded against. The backwardness may be due to unfavourable conditions. On the other hand, the intelligence of a sprightly, pleasant-looking child may easily be overestimated. If the tests come into general use, the children will easily learn what they are expected to do, and they will become almost valueless. If comparisons are to be made with other children, it is necessary to exercise great care in using the tests, and some have insisted upon a prolonged period of training. An experiment of Kohs is quoted, which shows that in six weeks a student can be taught to use the tests with a reasonable degree of accuracy.

Although the Stanford revised tests are more suitable for American than for British children, this English edition of Terman's volume is very welcome. Hitherto in this country, except in a few centres, comparatively little attention has been given to this useful method of investigating intelligence.

Mental Deficiency and Criminality.—Courts of law and the general public believe that any normal person is responsible for his actions, and that these actions are premeditated. Unfortunately, many persons, though apparently normal, are not so. Schapp² remarks that the relationship between the acts and the mental and physical deformities of these persons has not been recognized. The pathological criminal or mental defective is unable to adjust himself normally to his environment. The motivating activities of his brain are too seriously disturbed. "The mind is a duality. The motivating activities of the brain are regulated by two antecedent processes—the intellectual and the emotional (affective) activities." When these are well balanced, normal reaction results; when ill balanced, abnormal. The intellectual side of the mind receives perceptions, forms conceptions, and exercises judgement and reasoning. Any disturbance seriously involving either or both of these centres results in mental defectiveness. This may be divided into three types according to the causation: (1) Traumatic type, due to definite physical injury at, during, or soon after birth. (2) Formative type. The brain in whole or part has not developed owing to improper cell-growth. (3) Functional type. This is the most important class from a practical standpoint, as these cases are amenable to treatment. The brain-cells are not lacking in number, but there is a disturbance in the chemical substances from which they draw their potential energy. The cells do not react normally to stimuli. Their "threshold of functional activity" (the point at which potential energy becomes kinetic energy) is altered. If the threshold is raised, cells respond less actively or not at all; if lowered, they respond too actively. Disturbance of the internal secretions is the commonest cause of alteration of threshold. The commonest example is in hyperthyroidism; the threshold is lowered, and stimuli produce results which in normal life would not be strong enough to produce any reaction. The converse is exemplified in hypothyroidism. Toxins may cause the same result; these have a markedly selective action, affecting the higher centres first.

Impulses travel from the intellectual to the emotional centre. If these pass

the threshold, a wave of feeling or emotion results. If the threshold is lowered, the wave produced may be so strong that all restraining influences from the intellectual side are swept away, entirely blotting out thought of consequences and judgement of right. The mental deficient loses complete intellectual control of himself when these impulses come to him. Sometimes a negative or displeasurable wave is set up. This may impel him to some unreasonable but usually harmless act (as, e.g., in the various phobias, washing of hands in fear of infection). At other times a pleasurable wave predominates, and this usually results in the repetition of the act, which is frequently of a criminal type. These persons rarely benefit by their criminality.

In a large number of cases chemical disturbances of the blood have been found. More than half have been traced directly to the internal secretory glands, and there has been established a relationship between certain emotional types and a disturbance in a definite gland.

Mongolian Imbeciles.—Stoeltzner,³ of Halle, suggests that the peculiar form of mental deficiency known as Mongolian idiocy may be due to hypothyroidism in the mother. It has previously been noted that it is apt to occur in children born late in life, or after the birth of a large family, when it may be assumed the mother is exhausted with child-bearing. Stoeltzner quotes three cases in which the mothers presented the characteristic symptoms of deficiency of thyroid secretion and the children were Mongolian defectives. He admits he has records of seven cases which exhibited no such history, and is doubtful whether the hypothyroidism in the mother is the only cause of the Mongolism; but he considers it important to bear the connection in mind, so that during pregnancy thyroid medication should be carefully tried.

Middlemiss⁴ in 200 cases in Leeds found 8 Mongolian imbeciles. They were all males. He suggests that the condition arises from disease of the endocrine organs. In 5 cases the child was the last born; the youngest mother was 30, the oldest 46, and the average age of the mother was 37½. He further suggests that the Mongolism arises from exhaustion of the reproductive function.

REFERENCES.—¹*The Measurement of Intelligence* (G. Harrap, London); ²*Med. Record*, 1920, April 3; ³*Munch. med. Woch.* 1919, Dec. 26, 1493; ⁴*Jour. of Ment. Sci.* 1920, July, 272.

MENTAL DISEASES. (See also DEMENTIA PRÆCOX; MELANCHOLIA, INVOLUTIONAL; MENTAL DEFICIENCY; {*Bedford Pierce, M.D., F.R.C.P.*
MENTAL TROUBLES OF SYPHILIS.) {*Marguerite Wilson, M.B., Ch.B.*

The inscrutable problem of the relation between mind and matter, which is constantly with us as we study psychological medicine, has in recent years been approached from a new point of view. The physical changes which accompany emotion are to some extent explained by recent research on the sympathetic nervous system in relation to the function of the endocrine organs. Evidence has been accumulated which suggests that certain mental disorders, such as the anxiety psychosis, are essentially dependent upon disturbance of the sympathetic-endocrine system. Similar considerations apply in certain forms of mental deficiency, in dementia præcox, and in fact it is difficult to find an article on mental disorders anywhere which does not refer to disorders of the ductless glands or lack of tone in one or other divisions of the involuntary nervous system. The digestive difficulties of the depressed patient are elucidated by new terms—e.g., sympathicotonia—which fix the blame upon the sympathetic nervous system. But the essential question is, where does the morbid process begin? The new school assumes that prolonged emotional strain produces definite physical changes, and that we are able in the main to trace the connection of a purely mental disturbance with definite structural

tissue change. It is not possible to give all the steps in a long series of events, but a few interesting points may briefly be mentioned. The effect of emotion in the inhibition of secretion, the production of glycosuria with severe mental strain, the differentiation of the functions of the sympathetic and autonomic system, the excretion of adrenalin in terror-stricken animals (so long as the innervation from the sympathetic is intact), the essential unity of the sympathetic with certain portions of the ductless glands, are among the considerations which help us to understand something of the physical accompaniments of mental disorder.

For many years there has been doubt whether the bodily disturbance in states of depression preceded, or followed, or ran concurrently with, the melancholy. It has often been pointed out that prior to the attack the patient usually lost weight, and that recovery was heralded by improved nutrition. But this did not exclude the possibility that the depression and visceral disorders were both due to some common but unknown cause. It is now suggested that the constipation is due to disturbance of the sympathetic system, which leads to excessive excretion of adrenalin or other substances, which directly produces enterospasm; this in turn leads to toxæmia, which again reacts on the endocrine organs. The doctrine of the vicious circle is perhaps not very helpful. What is needed is to know how it begins and how to break it up, and if the new views of the influence of the emotions on these bodily functions be established, a valuable step will be taken in the desired direction. The psychogenic and physiogenic in the light of these considerations are no longer irreconcilable. If it can be demonstrated that prolonged mental stress produces definite changes in the sympathetic-endocrine system, which in turn affects digestion and may actually produce degenerative changes in nervous tissue, there is the beginning of harmonious relations between the psychologist, the physiological chemist, the vaccine therapist, and the histologist. They may all be dealing with the same disorder but with different aspects of it. It would be futile to assume that the workers in these various fields are as yet able to co-operate, and that their respective labours can be brought into clear relation one with the other; still there is a glimmer of hope that a broader and sounder philosophy of medicine will emerge from the bewildering contradictions of the present day.

Psychopathology of Mental Disorders.—An important contribution to this subject is found in a joint publication by R. G. Rows and David Orr.¹ It includes the Morrison Lectures, 1920, and an article by Orr on the interdependence of the sympathetic and central nervous systems in relation to the psychoneuroses. The articles review modern research on the sympathetic nervous system, the recent anatomical advances of Elliot Smith and Sherrington, and the work of Pavlov on reflexes in dogs and other animals. It is then asked whether the symptoms of the psychoneuroses may not be akin in their essential nature to the conditioned reflexes of Pavlov. A number of cases are quoted. The first and simplest was that of a man who passed into a state of terror when he heard a tin can falling. Analysis showed that when at the front he had been warned of an approaching gas attack by the beating of a tin. Other cases were less easily traced to past experiences. One man was terror-stricken when he entered a tram, another only when in a motor bus, a third when a hymn was sung, and in all these cases psychological analysis showed a mental mechanism similar to that of a conditioned reflex. Similar processes are assumed to produce more serious mental disorders, and several cases of anxiety neurosis and some of definite insanity are referred to. Throughout Rows speaks appreciatively of Freud's teaching, and the light that this throws upon the genesis of mental disorder.

Orr deals more particularly with the sympathetic-endocrine system. He says there is evidence that sympathetic centres occur in the brain and even in the cerebral cortex. He also considers that the mental strain produces definite bodily changes. "In the light of modern research the psychic stimulus with its ever-present emotional content forms the starting-point of the phenomena, and from this modifications of the endocrino-sympathetic system are produced which can influence the general nutrition of the organism and induce such changes in the central nervous system itself as to facilitate faulty mental mechanisms and tend to the production and maintenance of unphysiological neuronic action. If adrenalin reacts on the sympathetic system, inciting it to the production of more adrenalin and so producing a vicious circle at a low level, it would be unwise to deny the possibility of a similar repercussion of altered endocrine function on the neurones of the highest levels, viz., the cerebral cortex." Orr refers to the researches of Eppinger and Hess and the concepts vagotonia and sympathicotonia; to the criticisms of Castellino and Pende, who describe mixed conditions, and object to the rigid separation of the assumed physiological equilibrium of the sympathetic and autonomic systems; to Buscaino's demonstration of definite histological changes in consequence of fright; and to Pighini's account of sudden death following psychic trauma. He concludes by stating: "From the above it is apparent that we must take a much broader view of the etiology and development of the psychoneuroses than we have done hitherto. We can no longer regard them as psychic disturbances in the narrow sense employed in the past . . . but must approach the problem much more from the physiological side, as the interaction of the 'psyche' and endocrino-sympathetic system under emotion is so very obvious".

Both Rows and Orr are very sanguine as to the value of early treatment of the psychoneuroses; if they are treated early, declared insanity will be prevented. Thus Orr says: "The last five years have been of inestimable value in enabling us to recognize that a mental illness is simply a disturbed physiological process in which by early treatment the prognosis is quite good, and whose neglect inevitably leads to 'certifiable insanity'". Rows remarks: "During this stage (the primary) recovery is possible in the great majority of instances if not neglected, and therefore these illnesses need not be regarded with such feelings of helplessness and hopelessness as have prevailed up to the present day".

It is well to look at mental disorders hopefully, for the opposite point of view usually prevents research and experiment. Nevertheless, Rows clearly admits that the neuroses rarely pass into psychoses, and he suggests that declared insanity may be due to a superadded factor. The facts of everyday experience hardly justify the author's comforting anticipations. Moreover, the suggestion that insanity ought to have been prevented and would never have developed if appropriate treatment had been adopted is calculated to do a great deal of harm. Even if we admit all the claims of the modern psychotherapist—and some of them are very extreme—there is no escape from the conclusion that the great bulk of insanity is beyond their control. Unfortunately we are helpless in the presence of inborn defects of development, and there is at present little specific treatment of approved value for mental disorders due to toxæmia. Besides these there are large groups of cases the pathology of which is obscure, and for whom the physician can do little, although many recover under favourable hygienic conditions.

The Psychoses and the Neuroses.—In a valuable article entitled "The Identity of the Psychoses and Neuroses", John Macpherson discusses the reason why individuals break down in a particular way, and quotes Maudsley's conclusion

reached fifty years ago, that mental reaction depends upon "special determining conditions" which "lie hidden in that unknown region which we call by such names as 'temperament' and 'idiosyncrasy'". Using the term disease to cover the graver forms of mental disorder which are found in special hospitals, he refers to the extent to which unrecognized mental disorder exists in the general population, and says it is possible to detect almost anywhere various forms of mild dementia præcox, the periodic oscillations of depression and mild excitement, or the unfounded suspicions and the vindictiveness which indicate paranoia. These mild forms merge by insensible gradations into the pronounced forms. It is precisely the same with the functional neuroses, and in neither case is the declared and pronounced form typical of the group.

The essential similarity of both groups can be better appreciated by treating their natural history together. Thus :—

1. They are all markedly hereditary.
2. The heredity is transformable—neuroses appearing in the antecedents and collaterals of the subjects of the psychoses, and vice versa—from which we may imply a common hereditary basis.
3. They constitute genetic variations from the normal in respect of a hyperexcitability of the sensorimotor elements of the cerebral cortex, which render the subjects susceptible to mental suggestion or to physical or mental impressions which do not similarly affect normally stable individuals.
4. There is present in the majority of the subjects a perceptible psychical modification, more marked during the episodic crisis, and which tends sooner or later towards a varying degree of mental deterioration.
5. The symptoms exhibit a marked tendency to periodicity, irregular recurrence, exacerbation, or relapse.
6. As a rule this tendency to periodicity and recurrence continues throughout life, but it may weaken in mature life as the vital and sexual forces subside.
7. No anatomical lesion or defect of the nervous system has been observed upon which a pathology of the functional neuroses or the pure psychoses can be established.
8. There are present, at any rate in the severer forms which alone have been investigated, certain disturbances of metabolism, of the blood elements, and of the vasomotor functions, of the causes and nature of which we are ignorant.
9. The symptoms usually commence to manifest themselves in early life—childhood or adolescence.
10. The neuroses and psychoses have no geographical or racial limit, but affect individuals of all human races, and, so far as that is possible, of several of the higher animal species.

Macpherson discusses the last four of these points at some length, and in particular shows that epilepsy, hysteria in various forms, as well as sudden frenzy, occur in persons of all races, and that neuroses are also common in the lower animals. The article contains evidence collected from all parts of the world, and after surveying the whole subject he concludes that the neuroses and psychoses are essentially identical and that they "share in common an inborn constitutional defect which is ineradicable and irremediable". The war has demonstrated that "one and the same cause may originate in neuropathic persons any of the various forms of the psychoses and neuroses, dependent upon the peculiar temperament or idiosyncrasy of the individual".

Inimical causes continue to act in times of peace as in times of war, with the result that there exists in the general population a mass of definite and indefinite neurosis and psychosis which is at present unstudied and disregarded. An obvious corollary to the views that the neuroses and the

psychoses are fundamentally one, and that the psychoses extend far beyond the limits of legal certification, would be the recognition of the necessity for psychiatric clinics in all populous centres for the prevention and the early treatment of nervous disorders and for the education of the medical profession in the clinical features of medical psychology.

Insanity and Infection.—The extent to which mental disease is due to infection is still far from settled. Some authorities, such as Horen,³ declare that the type of reaction depends on individual predisposition and the physical state of the moment. There is no special form of insanity following infection: "There are no diseases, but only diseased persons." In the Belgian army a great variety of clinical types were observed, yet generally speaking the condition of the bodily organs coloured the mental symptoms. Horen points out how dependent the brain is upon the integrity of the other systems of the body.

Fell⁴ also states that there is no special type of insanity due to influenza. A great variety of symptoms arise either during or following the attack. He notes that there is usually defective heredity, and often a history of a previous attack. It is important to ascertain definitely whether the mental symptoms preceded the influenza; it not rarely happens that the disease aggravates a pre-existing mental weakness. He says that about one-third of the cases are of the dementia præcox type, which usually progresses more rapidly after an attack of influenza.

Cotton, Draper, and Lynch⁵ speak in no uncertain way of the influence of focal infection in producing insanity. They have treated 310 cases, with about 75 per cent recoveries. At least half the cases recovered when local foci in teeth, tonsils, and stomach were treated. About a quarter of the cases did not improve, and these presented symptoms of chronic invalidism, sallow face, narrow costal angle, and a long history of intestinal trouble. X-ray examinations were made. In these cases laparotomy was performed, and in all of them some abnormality was discovered—viz., cæcocolonic delay due to pericolic membranitis, recent adhesions, developmental defects, rotation of dilated cæcum, enlargement of ascending colon, chronic infected appendix, insufficiency of ileocæcal sphincter, etc. Enlarged mesenteric glands were frequently discovered: the group draining the ileocæcal junction, or the group draining the jejunum. These were found to be infected with streptococci or *B. coli*, and were taken as pointing out the part of the intestine infected. If not too extensive this was excised, and the part removed usually exhibited minute focal infections or irregular ulceration. This infection the authors consider to be the cause of much mental disorder. Cleansing the interior of the gut is of no avail, as the organisms are firmly entrenched within the intestinal wall. When the diseased area is too extensive for operation, reliance must be placed on serum or vaccine therapy. The authors state that replacing displaced organs is of no use.

This last observation is specially interesting in view of the striking cures that have been published through the fixation of displaced kidneys, and the rectification of misplaced uteri. The history of medicine in our own times is sadly too full of reported cures of nervous and mental disorders by operation. It is apt to be forgotten that large numbers of patients with these or similar visceral symptoms recover without operation; and when the depression clears up, the distressing symptoms referred to the intestines or other internal organs disappear spontaneously. Further, the critic may ask in what percentage of healthy people may be found some abnormality of the intestine, bands of adhesions near the ileocæcal valve, enlargement of the cæcum or colon, or displacement of this or that viscus. It would seem safer to look upon these intestinal symptoms as secondary, and not the primary cause of the illness:

a part of a vicious circle at a low level, and dependent upon nervous disorder of a higher order that remains unknown (*see* p. 317).

Brodsky⁶ considers that mental disturbance from chronic focal infection is comparatively rare. The original source is usually the teeth or the tonsils, due to the usual pus bacilli. The mental symptoms are manic-depressive in type. Psychoses due to acute infection (the acute toxæmias) are associated with any of the specific fevers, but they rarely occur in uncomplicated cases of diphtheria, tetanus, and tuberculosis. In these the chief symptoms are delirium and mental confusion. He states that "the presence of visual hallucinations or illusions should always be considered either an earmark of exhaustion or as a feature of more or less acute toxæmia".

Ford Robertson⁷ has no doubts upon the importance of toxæmia in the production of insanity. After stating that we can do little to alter the inherent qualities of the brain, which have been fixed by heredity, he goes on: "We can exercise now a very powerful corrective influence upon many of the common toxic conditions that excite mental disorder. . . . Most of these toxins are bacterial in origin. The invading bacteria can be isolated, and their injurious action is, to an important extent, capable of being controlled by therapeutic immunization. Hence the subject of bacterial infection has become one of paramount importance in the pathology of insanity, just as it is now one of paramount importance in the pathology of common maladies". He also believes that the common seats of infection are the mucous membranes of the respiratory, alimentary, and genito-urinary tracts. "The true cause of neurasthenia is chronic bacterial infection—exactly the factor that a hundred authorities ignore." He has investigated over a hundred cases, and found an intestinal neurotoxic micro-organism—an anaerobic diphtheroid bacillus. Acute confusional insanity is also due to a diphtheria bacillus which is intensely neurotoxic, and in some cases the organism is, as it were, saturated, and a constant stream of them is excreted by the kidneys. He, however, makes the significant admission that some of these cases demonstrate that psychical traumatism may increase the vulnerability of the nerve-cells and so determine the onset of the acute phase of the mental disorder. He further claims recoveries by therapeutic immunization in many cases of affective psychosis, due to chronic infection with a number of different organisms. Also he says that in dementia præcox in the active phase extremely severe bacterial infection is present, and he states that "in several cases made the subject of a general bacteriological investigation and immunized with autogenous vaccines, the progress of the malady appears to have been arrested". In general paralysis, according to the orthodox view, the spirochæte is the essential factor, but Ford Robertson claims that bacterial infection is at least as important, and that it is not the spirochætal one that kills the patient.

Again the critic is tempted to ask whether similar exhaustive bacterial investigations have been made sufficiently often in persons in good health, and whether there is necessarily any essential connection between the presence of these organisms and the mental disorder. Two interesting conclusions seem to emerge from these conflicting views. There is no uniformity in the mental symptoms presented by individuals suffering from any of the recognized infections; nor is it possible to predict from the character of the observed psychosis what organism is likely to be present. From which we may infer that there is some other essential factor, such as constitutional instability or other idiosyncrasy.

Hallucinations.—Hunter Steen⁸ has described, under the new name of 'chronic hallucinatory psychosis', a series of cases in which the principal symptom was the presence of hallucinations, with, in the early stages, little

or no other evidence of mental disorder. Formerly these cases have been included under such groups as 'melancholia', 'paranoia', and 'dementia præcox', but he believes that they form a definite well-defined clinical entity, and do not belong to any of these groups or other described affections.

Auditory hallucinations are the most prominent. In the first stage of the illness the patient recognizes their abnormality, and it is in the later stages, when he demands an explanation and none is forthcoming, that he accounts for them, and thus a delusion (frequently of persecution) results. Several cases are quoted, one in which the patient was quite aware of the abnormal character of the hallucinations, and another in which delusions of persecution developed in a patient who had been the subject of auditory hallucinations for several years. Steen points out that these cases do not come under the heading of 'dementia præcox', as no other symptoms of this disease were present. Further, they do not belong to 'paranoia', as the predominance of the hallucinations rules this out.

Considering the etiology of this disease, Steen states that it usually occurs in adult women whose family history reveals a 'nervous instability'. Trauma is quoted as a precipitating factor, but in all cases he believes that repression of a severe mental conflict is the chief cause.

As regards the symptoms, these cases begin with sleeplessness and mental uneasiness, and although the patient realizes at first that the voices heard are imaginary, later he seeks to explain them, and becomes the subject of hallucinations and delusions. During the early part of the illness there are no other mental symptoms, and the general behaviour is normal; but in the later stages the delusions assume control of the personality, and consequent changes result. Thus the patient becomes anxious, adopts a listening attitude, begins to converse with the voices, loses the memory for recent events, and becomes unable to fix the attention.

The course is progressive, although not continuous—periods of exacerbations and again subsidence may occur. But as the process is a gradual one, Steen uses the term 'chronic'.

The diagnosis has to be made from true melancholia, the manic-depressive group, the secondary and organic dementias, etc. Paranoia is characterized by the absence of hallucinations, and in a typical case of 'chronic hallucinatory psychosis' there is not the emotional apathy, the lack of judgement, the mannerisms, or the peculiar behaviour present in dementia præcox.

The treatment, Steen suggests, should be based on general lines in the first place, but if there be no improvement psychological analysis will probably elicit conflicts which may be resolved. When the condition has become chronic little can be done.

In concluding an interesting article, Steen hopes that further investigations will be carried out on this condition.

The Dress of the Insane.—Courbon⁹ has written a most interesting paper entitled "Sémiologie de la Mise (clothing, dress) des Aliénés". Man, he says, obeys two laws in clothing himself: (1) Necessity or utility—against climate, hardness of the ground, to indicate position in society, valour, as safeguard of modesty, shame; (2) *Æsthetic*—constant effort towards adornment and beauty. There is a tendency in groups of the sane to follow similar variations in dress (typically manifested in the army). This is not present in the insane; each is a law unto himself.

In the insane these two laws are modified: (1) The insane feel less, their organism is more hardened, therefore the need to cover themselves for protection against the elements and injury is less felt. The true utility for the insane is that which conforms to his delusions or hallucinations. Utility is over-

come by sensory troubles. (2) The need to deck or adorn is present subject to modification. It is present in mental enfeeblement, imbecility, delusions of grandeur, hysteria, erotic states. In melancholic states the spirit is burdened with too great a sorrow to feel beauty. Artistic ideas are commonly only a superficial manifestation; therefore they disappear first in illness. Occasionally in idiots there is a survival of the æsthetic taste. In the insane the colour, form, quality of an object chosen for decoration may be in excellent taste, but the sum total of these is deplorable. The lack of proportion, the unsuitability of the clothing for the occasion, the poverty of ideas or the fantastic extravagance, the profusion and violence of colours, all show the morbidity of the ideas.

The natural needs of protection and adornment are not the only ones that sway the insane. New pathological tendencies demand to be satisfied.

1. '*Collectionisme*'.—The impulsion to gather objects found (many normal human beings collect objects, but the collection has an end in view and the objects collected show some similarity).

a. Delusional collecting. The sufferer knows what he does, but does not recognize the abnormal character of the end he pursues. This type is selective, as the hypochondriac collects fluff and wool to cover and protect himself. It may also be present in 'persecuted' melancholia.

b. Obsessional collecting. The patient knows what he does, and recognizes the absurdity of it. He only seeks what the impulsion indicates, as in: (i) Fetichism—the collection of objects necessary to the eroticism; (ii) Kleptomania.

c. Unknowing collecting: (i) This is an automatic stereotyped act. The actor does not understand what he does, nor the end in view. It is present in dementia and confusion. (ii) The survival of a trait of character; the act of to-day lacking sense had at one time its significance. The miser heaps objects in a corner. The good housewife sorts and resorts odds and ends into orderly heaps.

2. '*Hallonnisme*'.—The impulse to destroy clothing. These persons remain clothed, but only in tatters.

a. Delusional or symbolical destruction. The sufferer desires to have an appearance conforming to the sentiment he desires to inspire. The melancholic publishes his indignity.

b. Impulsive destruction. This is probably a manifestation of the instinct of destruction. It is present in dementia, confusion with excitement, etc.

3. '*Nudism*'.—A more or less complete intolerance of clothing.

a. Delusional. The paranoic remains naked to avoid the evil influences from his clothing which his enemies have electrified. This form also occurs in melancholia, eroticism, mysticism.

b. Impulsive. In sharp attacks of dementia, confusion, mania, etc. The patient cannot bear anything touching the body.

c. Regressive. This is a reversion to a pre-human state. The sufferer develops tastes, habits, movements, different from the human. The condition has been called '*zoanthropoidisme mental*'. Dementia and confusion can produce it.

d. Obsessional. In this type inhibitory obsessions make it quite impossible for the patient to clothe himself. It is present in emotional states, '*folie du doute*', psychasthenia, etc. The condition is often intermittent. As a means of attracting attention, the insane frequently seek to modify the integuments—for example, the way of wearing the hair, the beard, the nails, tattooing, scarring, the use of paint, etc. Tattooing is fashionable in certain classes, but more often it indicates mental debility. It generally is a forerunner of the

development of the trouble, as it requires skill and patience. Paint ("abused by alleged normal persons") is frequently used in states where the care of dress is exalted—mania, imbecility, eroticism. The choice of colour, bad placing, etc., betray the loss of sense of beauty.

The Coverings of the Insane.—These may be anything—stones, metals, flowers, leaves, skins of beasts, hair, stuffs, glass, anything that suits the fancy, is fashioned into clothing and ornaments. The dress of each clinical entity varies :—

The *maniac* mocks public opinion and seems to do his best to appear mad. He has need of freedom and coolness ; therefore garments are open at the neck, waistcoats unbuttoned, skirts raised, hats on one side or carried. Decorations are used to express superiority or joy.

In the *systematized psychoses*, the subject is afraid of being thought mad. The appearance is abnormally normal. They are the most correct of all the insane, and only very late in the disease do they show the trend of their delusions.

In *melancholia*, thought is turned entirely in one direction. The patient dresses as one wishes. The clothing may be deranged and soiled, but not indecent. Even if he befoul himself, it is the penitent in dust and ashes.

In *dementia*, there is negligence and absence of thought ; collecting and destruction are frequently marked. There is an absence of all sentiment, and indecency results. It is unconscious, and not due to obscenity.

In *mental confusion*, the garments are anyhow. The mistakes are due to unsuccessful efforts to understand.

Idiocy resembles dementia. In imbecility and feeble-mindedness the clothing is foolish and exaggerated. In sexual perversion the costume of the opposite sex is worn. In obsessional cases the clothing depends entirely on the obsession.

REFERENCES.—¹*Functional Mental Illness* (1920, Boyd, Edinburgh) ; ²*Jour. of Ment. Sci.* 1920, April ; ³*Arch. méd. Belges*, 1920, Jan., 25 ; ⁴*Boston Med. and Surg. Jour.* 1920, i, 113 ; ⁵*Med. Record*, 1920, i, 719 ; ⁶*Ibid.* 994 ; ⁷*Jour. of Ment. Sci.* 1920, July, 227 ; ⁸Medico-Psychological Association, 1920, Feb. 24 ; ⁹*L'Encéphale*, 1919, Dec., 359.

MENTAL TROUBLES OF SYPHILIS.

Bedford Pierce, M.D., F.R.C.P.

Marguerite Wilson, M.B., Ch.B.

Formerly the etiology of mental trouble was considered as almost totally hereditary. To-day the influence of an infection or an intoxication, auto-genous or exogenous, is admitted. The part played by syphilis in the causation is no longer contested. It is accepted that this infection can provoke attacks in which the mental symptoms are the direct product of the toxic action on the central nervous system. Some authors use the term 'syphilo-psychoses'. This must be used in its widest sense. No clinical syndrome characterizes these states, which may take the form of many different psychoses. A. Barbé¹ classifies them as follows :—

Psychoses of Primary Period.—Episodic troubles may occur, obsessions, fixed ideas (nosophobia, syphilophobia). These occur in neuropathics, neurasthenics, and hypochondriacs—who are not malingerers. They may be due to : (1) Imagination ; (2) Infection got under the same circumstances as syphilis ; (3) Syphilis. Suicide, although fairly rare, may occur in these cases. Amongst the causes are : (a) Mental trouble—the syphilitic kills himself because he is insane ; (b) Despair in face of a severe attack ; (c) Terror at the revelation of the nature of the disease ; (d) Relation to a critical social situation, as imminent marriage.

Psychoses of Secondary Period.—These are common, and occur usually about the fortieth day. They are the results of toxi-infection, and not due to

cerebral lesions. The onset is sudden, with: (1) Intense headache, periodically worse at fixed hours, especially at night, and causing insomnia; (2) Asthenia; (3) Total occupation with the contemplation of the illness; (4) Pains at nape of neck and in dorsilumbar region; (5) Fleeting paresis; (6) Torpor; (7) Buzzing in the ears; (8) Abolition of knee-jerks; (9) Laziness of the pupillary reflex; (10) Gastro-intestinal and urinary troubles, with slight rise of temperature; (11) Mental confusion, anxiety, disorientation, delirium, hallucinations, ideas of persecution.

The diagnosis must be made by a combination of physical examination and laboratory methods. The differential diagnosis lies between: (a) Syphilitic psychosis; (b) Alcoholic psychosis; (c) Tuberculous meningitis. Prognosis is variable. It is relatively favourable in the cases with marked confusional symptoms, guarded in the dull or anxious type.

Psychoses of Tertiary Period (mental forms of cerebro-syphilis).—These occur long after infection, and depend on anatomical and pathological processes (meningo-encephalitis, arteritis, endarteritis obliterans, neoplasms, etc.). There is nothing pathognomonic in the symptoms, and they do not depend on the virulence of the primary infection.

The common symptoms are: (a) Mental—mental confusion, no dementia but an enfeeblement, agitation, hallucinations, depression, moral indifference, loss of attention; (b) Physical—motor abnormalities appear first—hemiplegia, aphasia, amnesia, apraxia, convulsions, cramps, contractures, ocular paralyses, exaggerated or abolished reflexes, inequality or irregularity of or Argyll Robertson pupils.

There are three common types:—

1. Pseudo-dementia or confusion. Onset generally rapid—insomnia, agitation, anxiety, disorientation, unconsciousness of reality, profound but partial amnesia, stupidity, incoherence. Differential diagnosis: cerebral tumours, acute Bright's disease, cranial trauma, general paralysis.

2. Periodic form. Characterized by anxiety, delusions, hypochondriacal ideas, delusions of persecution acute or chronic, refusal of food, suicidal tendency, excitement or depression. This form is difficult to distinguish from general paralysis.

3. Paranoid form. Slow progressive onset; systematized delusions of grandeur, persecution, jealousy, hallucinations, to a certain point conscious of condition, sudden fits of anger, goes on to deep dementia. Diagnosis is difficult. Differential diagnosis from general paralysis (in the latter the patient is quite unconscious of his condition), cerebral tumour, late epilepsy, organic dementia, chronic alcoholism. Prognosis is grave. There may be remissions.

Elementary psychic troubles may accompany tabes dorsalis, such as depression, hypochondria, irritability, syphilitic dementia, etc. The psychoses of congenital syphilis are serious, and of frequent occurrence. Syphilis, like alcohol, has disastrous effects on descendants. In adults many psychopathic states are due to this poison: constitutional neurasthenia, with impulsive and obsessional ideas, mental degeneracy, physical degeneracy (Friedreich's disease, etc.), myxoedema, Little's disease, etc. In adolescents, hebephrenia, hydrocephalus, juvenile general paralysis, etc., may occur. It is also a cause of a type of feeble-mindedness marked by laziness, unfaithfulness, ingratitude, bad memory. These children make bad scholars; they are unintelligent, and rebel against any attempt to improve their ways.

REFERENCE.—¹*Presse méd.* 1920, July 7.

MIDDLE-EAR DISEASE. (See OTITIS MEDIA.)

MOTILITY, DISORDERS OF.*J. Ramsay Hunt, M.D.*

According to Ramsay Hunt,¹ motility consists of *two components, kinetic and static*, each represented throughout the entire efferent nervous system by separate neural mechanisms. This is true not only of the segmental nervous system, but also of the larger integrating and co-ordinating masses of the brain and cerebellum. These two systems are mutually co-operative, and yet physiologically and anatomically distinct. Under normal conditions they are inseparable and act in unison, and the harmony of their relation is only disturbed by the dissociations of accident or disease. One of these components of motility is the movement proper, which is subserved by the *kinetic system*. The other represents the more passive form of contractility, which we recognize in tonus, posture, attitude, and equilibrium. This static function of the efferent system is subserved by separate neuromuscular pathways, which may be termed the *static system*.

Comparative anatomy shows clearly that the muscular system, like all other structures of the body, is in a state of evolution, adapting itself to the changing conditions of the organism. Development is from the slow movement of the unstriated to the quick movement of the striated muscle fibre; and in man all gradations may be observed, from the lowest type of unstriated muscle to the highest type of the striated muscle fibre. Striated muscle contains two substances, both capable of contraction. The one is the *disc mechanism* of the muscle fibre, which gives rise to the quick movement or the twitch. The other is the *sarcoplasm*, which yields a more plastic form of contraction.

A clear conception of the phylogeny of contractile tissue is important to the author's theory, as he does not regard the skeletal muscle mass in man as a mere aggregation of muscle fibres of a standard type, but rather as systems of end-organs representing different stages of phylogenetic development, and thus corresponding in some measure to similar differentiation in nerve tissue.

Motility in animal life is usually divided into three groups: (1) Reflex; (2) Automatic and associated; and (3) Isolated synergic movements. It should be seen, however, that one group merges imperceptibly into the other, and the transition is so gradual that it is difficult to say where one type ceases and the other begins. All of these movements, reflex as well as automatic, have their corresponding static components, and every cessation of movement is immediately followed by fixation of the contraction in posture.

In the higher mammals, and especially in man, one encounters a new form of movement, which differs from reflex and automatic movements in the quality of individuality and dissociation.

In all of these isolated forms of voluntary movement there is also the element of posture, and it may be stated without fear of contradiction that there is no form of motility, from the simple reflex to the most skilled and individualistic type of movement, which functions without a corresponding static mechanism.

In a general way the *central nervous system* may be said to represent three great structural and functional divisions: (1) A *segmental nervous system*, which contains the great reflex systems of the neuraxis; (2) A *palæo-encephalon*, which represents the essential sensory and motor mechanism in lower forms; (3) A *neo-encephalon*, which has its greatest development in man, and subserves the highest functions of motility and sensibility. The author believes that these three great functional divisions of the nervous system are related to the three great types of movement and posture enumerated above.

In this conception, he regards the *cerebellum* as the great correlating centre for the *static functions* of motility, in contrast to the corpus striatum and Rolandic area, which he regards as the essential correlating centres for the

control of their respective forms of kinetic function. Furthermore, he believes that these systems are represented by special end-organs in the skeletal muscles in the same manner as we conceive sensations with their special systems and modes of termination.

The *skeletal musculature* is composed of striated muscle held together by connective tissue, by means of which the contractile mass performs its functions. As we have seen, each striated muscle fibre is composed of two distinct substances, which are now generally recognized by physiologists as subserving different types of motor function. In a general way it is estimated that the *disc system* constitutes about one-sixth to one-quarter of the total muscle mass, the remaining portion of which is *sarcoplasm*. Each muscle fibre contains a motor nerve-ending, which is the terminal of a medullated nerve-fibre. For many years this was thought to be the sole innervation of the muscle fibre, until Perroncito and Bolke demonstrated the existence of another smaller nerve-ending in the striated muscle fibre which was shown to be the terminal of a non-medullated nerve. The existence of two separate contractile systems in striated muscle fibres is also shown very clearly by the electromyogram. In myotonia congenita the presence of two distinct contraction waves may be demonstrated: the one quick and referable to the disc system; the other slower, more sustained, and of sarcoplasmic origin.

In the author's theory of a dual efferent system, the discs are to be regarded as the end-organ of the kinetic system and the sarcoplasm as the end-organ of the static system—just as we conceive the heat and cold spots or the tactile corpuscles as end-organs in their respective sensory spheres. These end-organs of the skin have undergone special differentiation on certain parts, and have thus acquired a greater accuracy and refinement of function. He believes that a similar specialization of function and structure exists in the skeletal muscles. By this he would emphasize what perhaps is not generally recognized, that the muscle-fibre system, like the nerve-fibre system, participates in phyletic differentiation, and that those muscle fibres which subserve the higher functions of neokinesis are more highly specialized than are those which are concerned with palæokinetic function.

According to this conception, the corticospinal system (pyramidal tracts) and the striospinal systems (extrapyramidal tracts) would both be represented by their respective contractile end-organs. As the striospinal system is older, the muscle fibres subserving this function would be less highly differentiated than those subserving the highest cortical function.

This theory is confirmed by the existence of two kinds of fibres in skeletal muscles: the *pale* fibres, which are rich in contractile substance, and contain comparatively little sarcoplasm; and the *dark* fibres, which are rich in sarcoplasm, with a relatively simple disc mechanism. Both kinds of fibres are found in all muscles in varying degrees. The pale fibres are the quick contracting, and the dark fibres the slow contracting fibres of the physiologists. And the quickness of a muscle contraction, which varies considerably in different portions of the body, depends upon the relative number and distribution of these two types of fibres.

Relation of the Dual System of Motility to Symptomatology.—In general, it may be stated that a lesion of the kinetic system causes a disorder of movement, and a lesion of the static system a disorder of tonus or the posturing mechanism. In many of the disturbances of motility both systems participate, although it is usually possible to indicate one or the other as the essential factor. At the segmental level of the nervous system the tendon reflex is a typical example of kinetic function, as is the muscle tonus of static function. These two components may also be recognized on direct percussion of the muscle,

by the quick contractions of myotatic irritability and the more persistent local reactions of the idiomuscular response.

Such disorders of motility as paramyoclonus multiplex, myokymia, and fibrillary twitchings are irritative phenomena in the kinetic spinal mechanism. The clonus of spastic paralysis and the tremor of paralysis agitans are both of kinetic origin. One is related to the neokinetic, and the other to the palæokinetic system. The more plastic tonicidity which is also present in both of these forms of palsy is of sarcoplasmic origin, and referable to the static system. Huntington's chorea and epilepsy are both of kinetic origin; the former is referable to the striatal and the latter to the cortical level of motility. Rarely in epilepsy there are attacks which suggest a relation to the static system. These are characterized by a sudden loss of postural control without convulsive manifestations (static seizures, static epilepsy).

Other disorders of motility, referable to the corpus striatum, such as athetosis, dystonia, progressive lenticular degeneration, and paralysis agitans, represent different degrees of involvement of its efferent and inhibitory systems. This phase of the subject has been considered in detail in the author's² contributions to the symptomatology of the corpus striatum.

All forms of myotonia—cerebral, cerebellar, spinal, and peripheral—would appear to be of sarcoplasmic origin and to be referable to the static system. There is also much in favour of the hypothesis that tonic spasms of cerebellar origin and the tonic rigidity of tetanus are contractile manifestations of sarcoplasm.

The nature of the Bárány reactions to labyrinthine stimulation would also indicate a very definite relationship to the static system and the sarcoplasm; e.g., the *slow* component of the nystagmus is the direct response of the static system to labyrinthine stimulation, the quick response representing a compensatory reaction on the part of the kinetic system.

One organic symptom in particular is closely related to the static function of the cerebellum, viz., the *intention tremor*. The intention or cerebellar tremor presents the characteristics of a loss of the static component of motility. The coarse tremor movements may be regarded as efforts of the kinetic system to compensate for the loss of the posturing or static functions of sarcoplasm.

In addition to these various somatic expressions of kinetic and static function, a similar division may be recognized in the mental sphere. Among these may be mentioned catalepsy, catatonia, and certain of the hyperkineses of psychic origin. A *psychostatic* and *psychokinetic* representation may therefore be postulated at the psychic level of motility.

REFERENCES.—¹*Arch. of Neurol. and Psychiat.* 1920, Oct., 353; ²*Brain*, 1917, 58.

MULTIPLE SCLEROSIS. (See SCLEROSIS, MULTIPLE.)

MUMPS.

J. D. Rolleston, M.D.

BACTERIOLOGY.—R. L. Haden,¹ whose paper on the cerebral complications of mumps was recently abstracted (*see MEDICAL ANNUAL*, 1920, p. 239), thinks it doubtful whether the condition produced by Wollstein (*Ibid.* 1919, p. 264) in cats, by injection of the sterile filtrate of the saliva of patients in the active stage of mumps, was really the disease. He reports five cases of mumps in soldiers in whom a Gram-positive diplococcus was isolated from the spinal fluid, the blood, and a lymph-gland. Injection of the organism into the testicle of a rabbit produced severe orchitis in ten days. He therefore concludes that mumps is probably caused by a Gram-positive diplococcus, and not by a filterable virus as suggested by Wollstein.

SYMPTOMS.—Under the name of the *duct sign*, D. M. Cowie² describes a phenomenon which he found in 96 per cent of his cases of mumps, and thinks is probably present in all cases of parotid mumps at some time in the course of the disease. It consists in a reddened spot, measuring 1 to 2 mm. in diameter, corresponding to the orifice of Steno's duct on the affected side. The duct will usually be found to project beyond the surface of the mucous membrane from 1 to 3 mm. In contrast with the central red spot the duct is usually pale, but is sometimes slightly injected. No changes were seen in the ducts in submaxillary mumps, or parotid mumps in which the submaxillary glands were involved. Cowie has not determined whether the sign is pathognomonic of mumps, or is present in other acute inflammations of the parotid gland.

T. Howard³ reports three cases of *meningo-encephalitis* which he considered the only manifestation of mumps on the following grounds: (1) They occurred during an epidemic of mumps. (2) Two of the patients had never had mumps, and one gave a history of it, though he could not remember the attack himself. (3) They all presented mild symptoms of meningo-encephalitis which were entirely relieved or much improved by lumbar puncture. (4) Two of the cases showed the Gram-positive diplococcus described by Haden in the cerebrospinal fluid, both in direct smears and in pure cultures. (5) The spinal fluid in each case presented a moderate lymphocytosis; the other conditions besides mumps in which cerebrospinal lymphocytosis is found—viz., syphilis, tuberculous meningitis, and lethargic encephalitis—could be excluded, except in one case which gave a positive Wassermann reaction, and even in that case the Gram-positive coccus was repeatedly found in the spinal fluid, so that some infection besides syphilis must have been present.

Neuritis, of which Rompe⁴ records an example, is a rare complication of mumps. Most frequently it is a polyneuritis chiefly affecting the extremities. The facial, optic, and auditory nerves may also be affected. The prognosis is favourable in polyneuritis and neuritis of the auditory nerve, but unfavourable in cases in which the facial and optic nerves are involved.

A complication of mumps not hitherto described, viz., *enlargement of the thymus*, is reported by J. Sailer,⁵ who found 6 examples of it among 6000 mumps patients at Camp Wheeler. Usually on the third or fourth day of disease, sometimes later, œdema appeared over the manubrium and extended down the middle of the sternum and on either side as far as the midclavicular line, obliterating the sternal notch. The patients suffered from slight dyspnoea, and presented dullness over the sternum. Skiagrams showed slight enlargement of the thymus. All the symptoms disappeared in four or five days, and there were no sequelæ.

Ruge⁶ records a case of *hæmatoma of the ovary* complicating mumps in a woman, age 24. The symptoms subsided without operation.

Cases of *pseudo-mumps* or chronic parotitis have frequently been observed by foreign writers, such as Dénéchau, Mallié, and Blumenthal,⁷ especially in soldiers. The swelling is usually apyrexial, is not contagious, and is not associated with any complications or sequelæ. Examination of the bucco-pharyngeal cavity often shows some source of infection, such as gingivitis, stomatitis, or tonsillitis. It is also possible, as Blumenthal suggests, that the munching of coarse food, such as is provided for soldiers on campaign, may be a factor in the enlargement of the glands.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1919, ii, 698; ²*Amer. Jour. Dis. Child.* 1920, ii, 75; ³*Amer. Jour. Med. Sci.* 1919, ii, 685; ⁴*Med. Science*, 1920, iii, 130; ⁵*Contrib. Med. and Biol. Research, dedic. to Sir W. Osler*, 1919, ii, 1172; ⁶*Munch. med. Woch.* 1919, 1422; ⁷*Med. Science*, 1920, iii, 131.

MYIASIS.*Herbert French, M.D., F.R.C.P.*

Myiasis, or the existence of maggots or other larvæ in the nose or other part, is uncommon in Northern Europe, but less rare in the tropics, and De Almeida¹ draws attention to the value of Chloroform inhalations in causing the expulsion of such maggots.

The symptoms produced may be far from suggesting the correct diagnosis sometimes, and amongst the cases he quotes there is one in a man lying almost unconscious, able only to groan and press his hand to his head in such a way as to suggest that he was suffering from meningitis; another in which gonococcal infection of the nose was suspected; another in which, in association with a serous discharge from the nose, the main symptoms were headache, dizziness, pyrexia, and vomiting; and so on.

When De Almeida suspects myiasis, he gives inhalations of chloroform, and has found that this treatment immediately causes the maggots to wriggle out of the nose, ear, or other part that has become infected; cure then resulting if the real nature of the condition has not remained obscure so long that a stage of extensive destruction of the parts has been reached; or alternatively pyogenic infection has supervened, with consequent death from pyæmia or septicæmia. He finds the use of chloroform in this way the easiest and best method of getting rid of the maggots; and if they happen to be in the ear instead of in the nose, he uses the chloroform upon pledgets of cotton-wool as an alternative to the inhalation method which is applicable to the nose.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1919, Nov. 22, 1648.

MYOCLONUS MULTIPLEX, ACUTE INFECTIOUS, AND EPIDEMIC. (*See also ENCEPHALITIS, EPIDEMIC.*) *J. Ramsay Hunt, M.D.*

As acute infectious myoclonus multiplex, Ramsay Hunt¹ directs attention to an unusual clinical type of acute infection of the nervous system which may appear both in sporadic and in epidemic form. The isolated or sporadic form is quite rare. Epidemic myoclonus multiplex, on the other hand, has been of frequent occurrence during the last year, and represents a special type of the epidemic encephalitis.

SYMPTOMATOLOGY.—The onset of the disease is acute, and is characterized by sharp shooting pains in the trunk and extremities, at first local but rapidly becoming generalized. They may reach an extreme degree of intensity. Spinal pains are sometimes present, but are not nearly so intense as in the more peripheral areas.

The pains are soon followed by the pathognomonic muscle-jerks, waves, and twitchings (myoclonus and myokymia multiplex) which characterize the affection. The muscle contractions follow in the wake of the pain, and make their appearance in those parts where the pains were first manifested. In some cases an interval of a week may elapse before the appearance of myoclonus and myokymia. The twitchings are bilateral and multiple, and may be generalized. A tendency to localization in certain regions of the body may occur, the muscles of the abdomen and lower extremities showing an especial vulnerability. The contractions are of quick clonic character, involving individual muscles or portions of muscles, but not synergic groups, so that the resulting locomotor effect is comparatively slight.

In many of the cases there is well-marked delirium, which varies in duration and intensity with the severity of the infection. In milder types there may be only irritability, restlessness, and insomnia, associated with anxiety and apprehension. The myoclonus delirium presents the characteristics of a toxic delirium, and is accompanied by hallucinations, illusions, and transitory delusions. There are restlessness, insomnia, apprehension, disconnected

thought, and mental confusion. The symptoms are all more conspicuous at night, and the delirium content frequently takes on an occupation form. In the graver cases there is an attention disorder, with symptoms of Korsakoff's syndrome. In the late stage there may be apathy and a tendency to stupor.

During the course of the disease there is moderate fever, acceleration of the pulse, and often hyperidrosis. The degree of sweating seems to bear a relation to the activity of the muscular phenomena. There is no tenderness of the nerve-trunks, but during the painful stage there is general sensitiveness to movement and surface impressions (hyperæsthesia). The myotatic irritability of the affected muscles may be increased, and there is sometimes an exaggeration of the normal idiomuscular response (myoidema).

There is no paralysis or paresis of any muscle or group of muscles. The sensory disturbances are chiefly irritative in character, consisting of pain, hyperæsthesia, and occasional paræsthesias in the distal parts of the extremities. There is no anæsthesia in the usual sense, and only rarely a diminished sensibility to pain during the acute stage of the disease. There is no ataxia and no loss of the deep sensibility. The tendon reflexes are usually present and active. Occasionally in the later stages the Achilles-jerks and the knee-jerks are diminished or not elicitable.

There are no other evidences of organic disease of the nervous system, and the clinical picture is characterized by myoclonus and myokymia multiplex, lancinating pains, and delirium. The mode of onset and course of the disease are suggestive of an infectious process with limited, selective involvement of the central nervous system.

The relationship of the epidemic form of myoclonus multiplex to epidemic encephalitis is shown not only by its prevalence at the same time, but also by various combination forms (cranial-nerve palsies and myoclonus) which have been encountered. And there is little doubt that all of these various types are related to the same etiological factor; whether this be true of the sporadic type of myoclonus multiplex is, the author believes, still an open question.

Paramyoclonus Multiplex and Myokymia.—The peculiar nature of the motor disorder which these cases present is well recognized in neurological literature, and is described under such headings as paramyoclonus multiplex, myokymia, and myoclonus fibrillaris multiplex. They are all to be regarded as representing varying degrees of a fundamental type of motor disorder, referable to the lower motor neurones. A variety of etiological factors have been recognized. Among these may be mentioned shock, exhaustion, exposure to cold, diabetes, lead poisoning, trauma, and alcoholism. Myokymia has also been recorded as a late sequela of sciatica and poliomyelitis. Similar muscular phenomena have also been observed in the course of certain infectious diseases, as diphtheria, malaria, and acute articular rheumatism.

Paramyoclonus multiplex and myokymia are not to be confused with myoclonia of the cortical type. Cortical myoclonia is a motor disorder which affects synergetic groups of muscles and produces considerable locomotor effect. It resembles much more, in the character of movements produced, chorea or the *tic convulsif*, and is readily differentiated from myoclonus of the spinal type. The latter is characterized by involvement of individual muscles or portions of muscles which, as such, are not under voluntary control.

Pathology has thrown very little light on the localization and nature of these motor disorders. They are evidently irritative manifestations resulting from direct or reflex excitation of the peripheral motor neurones, the exact seat of which cannot be determined in the present state of our knowledge.

Nine cases of infectious myoclonus multiplex have come under the author's observation during the last sixteen years, two being sporadic cases, one in 1904

and another in 1914. The remainder were of the epidemic type, and occurred during the recent epidemic of lethargic encephalitis. In the sporadic cases, the muscle-waves and twitchings were generalized, and this was also true of the earlier cases of epidemic type. Later, when the epidemic was on the wane, a milder type was encountered, without active delirium, and muscle-twitching was limited to the lower half of the trunk muscles. In this group of cases, pain was quite severe and very persistent.

DIFFERENTIAL DIAGNOSIS.—The nature of the disease becomes clear as soon as the characteristic muscle-jerks and twitchings make their appearance. Before this it would be difficult to exclude any acute disease beginning with sharp pains and presenting the other evidences of a general infection.

Multiple neuritis with delirium may be excluded by the absence of motor or sensory paralysis and of tenderness. *Acute poliomyelitis* may also be excluded by the absence of paralyses and consecutive muscular atrophy. *Dubini's disease*, an obscure affection of the nervous system which is epidemic in certain parts of Italy, notably Lombardy, may also be excluded.

The affection might present a marked resemblance to the infectious chorea with mental symptoms (*chorea insaniens*). The nature of the motor disorder is, however, quite different. In chorea there are purposeless, inco-ordinate movements, with marked and characteristic motor effects, in contrast to the muscle-jerks and twitchings of the myoclonus-myokymia type, which are not under synergic control, and which are indicated by waves and undulations rather than by movements of the part. In both diseases, infectious chorea and infectious myoclonus, the mental disturbances are those of toxic delirium. In the more severe cases (*chorea insaniens*) the symptomatology is that of a grave toxic psychosis with chorea. A similar termination may occur in the more severe forms of infectious myoclonus, and a *myoclonus insaniens* may result, in which a grave toxic psychosis is associated with the motor manifestations of myoclonus multiplex.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1920, Sept. 11, 713.

NÆVI. Electro-therapeutic treatment discussed (p. 38).

NASAL ACCESSORY SINUSES.

A. J. Wright, M.B., F.R.C.S.

Gunshot Wounds of the Nasal Accessory Sinuses.—O'Malley,¹ as a result of his experience in treating 59 cases of these wounds, has formed the following general conclusions. X rays are useful to diagnose a bone injury or presence of a foreign body. Opacity to the rays, however, may be due to subperiosteal, submucosal, or intersinus hæmorrhage, to previous mucosal inflammatory thickening, or to the presence of pus or polypi. Exploratory puncture may show which of these is the actual cause of opacity. Opacity is greatest, and frequently lasts for many years, in cases in which the outer bony walls have been injured. In some cases of injury of the anterior antral wall, the pupil is lit up on transillumination while the infra-orbital region remains dark. An antrum may receive a severe injury, but, in the absence of a patent communication with the mouth or external air, sepsis is uncommon. Repair following trauma, as contrasted with that in diseased conditions of the sinuses, is very striking. The free drainage of a septic sinus, resulting from trauma, into a well-ventilated nasal passage, is followed by rapid cure of the septic condition. A foreign body lying uncovered in a sinus leads to sepsis, and should be removed as soon as possible.

External Surgery of the Nasal Accessory Sinuses.—Coakley,² in common with most other rhinologists, has found that bolder and more thorough intranasal operations have removed the necessity, in a large majority of cases, for the

performance of any external operation. Thus, of 273 cases of frontal sinus disease treated during the last eleven years, only 7 have been submitted to external operation. He advocates the Killian external operation on the frontal sinus, where any external operation is necessary. Failures as a result of this operation are always due to the leaving of a portion of the sinus mucosa, either in the upper portion owing to incomplete removal of the anterior wall, or in an ethmoidal cell situated in the floor of the frontal sinus near the external angular process of the frontal bone. He has found it an advantage to use two separate incisions for exposing the frontal sinus and ethmoidal labyrinth respectively, rather than the original combined Killian incision.

Accessory Nasal Sinuses of Children.—Oppenheimer³ suggests that infection of the accessory sinuses in children is a relatively frequent condition. The sinuses are developed at a much earlier period than is usually taught. The antra and ethmoidal cells are most frequently involved. Symptoms are said to be obscure and rarely characteristic. Infectious diseases are a frequent cause. X rays in the young infant are the most useful diagnostic medium. Presence of a purulent discharge, particularly if unilateral and accompanied by intermittent headaches, is of great diagnostic value. Treatment, as in the adult, consists in supplying free intranasal drainage and ventilation, external operation being reserved for cases of great severity or with complications.

Dean and Armstrong,⁴ writing on the same subject, state that this condition is responsible for such conditions as arthritis, pyrexia, nephritis, chorea, and pulmonary infections. The symptoms are sneezing, nasal obstruction and discharge, and headache. The condition is nearly always accompanied by diseased tonsils and adenoids, and examination of the nose is best carried out while the child is under an anæsthetic for removal of the latter. Removal of the tonsils and adenoids is usually sufficient to cure the sinus condition. Of 145 cases of adenoids, or tonsils and adenoids, 65 showed sinus disease.

Accessory Sinus Disease causing Loss of Vision.—Much attention has been directed to this question. White⁵ suggests that changes can be produced in the optic nerve, with resultant loss of vision, by disease in the posterior ethmoidal and sphenoidal sinuses, acting either by direct spread of inflammation to the nerve, by toxæmia due to septic absorption, or by hyperplasia. By the latter term is signified a rarefying osteitis associated with inflammatory swelling and fibrous thickening of the mucous membrane lining the accessory sinuses. This condition is invoked in those cases which show no apparent pathological changes on examination or histologically, and yet in which operation on the sinuses apparently produces improvement in the optic nerve. A number of illustrative cases are related, and the opinion is expressed that all cases of optic neuritis or retrobulbar neuritis for which no other cause can be found should be submitted to operation on the posterior group of nasal sinuses.

Cushing,⁶ dealing with this problem, sounds a word of warning. He allows that suppurative inflammations of the ethmoidal or sphenoidal cells may affect the optic nerve in such a way as to produce hyperæmia of the optic disc, but says that a true choked disc can only occur in the presence of increased intracranial tension. He has seen many patients with brain tumour who had recently undergone intranasal operations for assumed infection of the sinuses, and is convinced that many unnecessary fatalities must result from ill-advised operations on nasal sinuses performed in the hope of relieving an unexplained amaurosis.

Sphenoidal Empyema and Epidemic Cerebrospinal Fever.—The association of these two conditions, first noticed by Westenhoeffer, has been the subject of research by Embleton.⁷ In 34 autopsies on the subjects of cerebrospinal meningitis, sphenoidal-sinus empyema was found in 32. This series embraced

all clinical types of the disease, the subjects having died, (1) In the acute attack; (2) In a recrudescence developing between the fifth and twelfth days; (3) From hydrocephalus after partial recovery; (4) From a relapse months after the first onset. The nasopharynx is undoubtedly the site of primary infection in epidemic cerebrospinal meningitis, the meningococcus having been demonstrated in this situation in carriers and early in the acute attack. Carriers are frequent, but the development of meningitis is comparatively rare. Carriers always suffer from 'colds', the nasal discharge showing meningococci in pure culture. Nasal catarrh seems the natural disease produced by the meningococcus, meningitis occurring only when some other factor is introduced, this factor being probably a sphenoidal empyema. Each of a series of ten hydrocephalus cases showed sphenoidal empyema.

Peters⁸ deals with this subject from the point of view of operation on the sphenoidal sinuses. Three cases operated on in the acute stage all died. In relapsing cases the results are definite and encouraging. Of 5 such cases operated on, 4 recovered, but there was post-operative exacerbation of the disease in all cases.

Babcock⁹ compares meningococcus with diphtheria carriers, in that in both the organisms are liable to lurk in the recesses of an adenoid mass. He found that a group of very resistant meningococcus carriers showed a high incidence of adenoids, and the correction of diseased conditions of the nose and throat was of considerable aid in eliminating meningococci from chronic carriers.

Treatment of Malignant Tumours of the Antrum.—As an alternative

to resection of the upper jaw, which in the past has not given good results, New,¹⁰ at the Mayo clinic, has been using the actual cautery and radium. He is convinced that the results from the latter form of treatment are an advance. Eighteen cases were treated by the cautery and radium,

although in many the lesion was so extensive that a resection of the jaw would not have been indicated. The technique employed is as follows: Anæsthesia is induced with ether by the drop method. The head is lowered to prevent secretions entering the trachea. A gag is inserted on the opposite side to the growth, and a water-cooled retractor on the diseased side to protect the cheeks and lips when the cautery is used (*Fig. 43*). The growth is attacked where it appears in the mouth, either through the palate or from above the alveolar process. The soldering iron is used as a cautery at a dull-red heat, being carried gradually into the antrum, and the entire growth thoroughly 'cooked'. Since there is practically no bleeding, the walls of the antrum may be inspected to determine whether or not the growth has been thoroughly removed. It may be necessary to cease operations and re-induce anæsthesia two or three times.

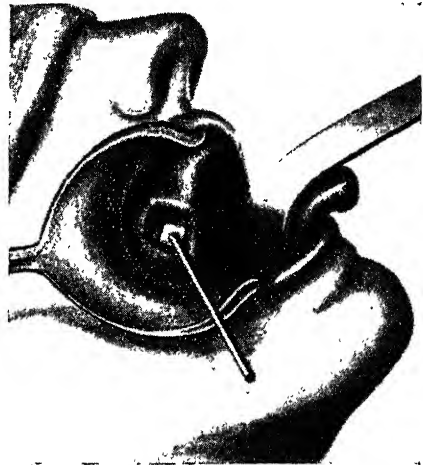


Fig. 43.—Treatment of malignant tumours of the antrum. Water-cooled retractor in place on diseased side; soldering iron going in above the alveolar process. The antrum is opened through this route in cases in which the cheek is involved.

(Reproduced from 'The Journal of the American Medical Association'.)

Rapidly-growing sarcomata respond well to radium, and it is therefore not necessary to cauterize so thoroughly as in the case of the more malignant squamous epithelioma. The mixed-tumour type of epithelioma, or cylindroma, is of a low-grade malignancy, and does not require such radical treatment.

Radium or its emanations are employed in tubes directly introduced into the antrum at the point at which it seems most needed, either at the time of operation or about two weeks later. The dosage used is 100 or 200 mgrms. for twelve to twenty-four hours—the treatment is repeated in three weeks if indicated. Most of the inside of the antrum comes away as a sequestrum in two months' time.

Results : No operative mortality or post-operative chest complications. Of the 18 cases treated, 3 are dead, 2 have extensive recurrences, and 10 are well and with no recurrences over a period of from eight to twenty-eight months ; 3 cases were lost sight of.

REFERENCES.—¹*Jour. of Laryngol. Rhinol. and Otol.* 1919, Sept., 333 ; ²*Surg. Gynecol. and Obst.* 1920, March, 309 ; ³*Jour. Amer. Med. Assoc.* 1919, Aug. 30, 656 ; ⁴*Ann. of Otol. Rhinol. and Laryngol.* 1919, xxviii, 452 ; ⁵*Boston Med. and Surg. Jour.* 1919, Oct. 16, 483 ; ⁶*Jour. Amer. Med. Assoc.* 1920, July 24, 236 ; ⁷*Brit. Med. Jour.* 1920, Jan. 3 ; ⁸*Jour. of Laryngol. Rhinol. and Otol.* 1920, Jan., 11 ; ⁹*Laryngoscope*, 1919, August, 486 ; ¹⁰*Jour. Amer. Med. Assoc.* 1920, May 8, 1296.

NASAL DERMATITIS. (See DERMATITIS.)

NEPHRITIS.

John D. Comrie, M.D., F.R.C.P.

Mandelbaum,¹ by experiment on the transfusion of serous fluids through animal membranes, has investigated the essential cause of 'albuminuria'. He comes to the conclusion that albuminuria should be looked upon, not in the light of a passive filtration through cells which are damaged and therefore unable to retain albumin, but rather as an active excretion by cells stimulated through abnormal conditions to excrete actively protein bodies, which ought to be, and normally are, retained. Non-nephritic albuminuria was discussed by Wallis² at a meeting of the Royal Society of Medicine. This term he employed to include various types of transient, orthostatic, adolescent, etc., albuminuria, and a condition which has of late been described as 'leaky kidney'. In nephritis the main protein excreted is serum-albumin, while, in purely functional conditions of proteinuria, globulin either as euglobulin or as globulin combined with lipoids is largely present. Globulin can be detected by the cloud which forms when the urine is dropped into distilled water, or by precipitation with acetic acid in the cold. These tests are, therefore, while very simple, at the same time important in distinguishing the more serious organic albuminuria cases from the functional and transient cases of globulinuria. After treatment, in cases of syphilis, by salvarsan, a persistent globulinuria may also develop.

Petren³ considers that in acute nephritis the question of rise in blood-pressure is very important as regards prognosis, this being less favourable for complete recovery if marked hypertonia has been present in the course of the acute stage.

Day and Clarke⁴ have made an experimental study upon the origin of nephritis. They note that by various observers *Staphylococcus aureus*, a streptococcus, or *B. coli* has been isolated in culture from catheter urine of cases suffering from acute nephritis. In a series of such cases they obtained from the urine bacilli of the coli-typhoid group, and found that, injected into animals, cultures of these reproduced acute nephritis, which ran a prolonged course. They believed that vaccines made from these organisms produced rapid amelioration of symptoms in cases where they were used. Nolf⁵ found

cases of staphylococcic bacteriuria frequently among Belgian soldiers, occurring as a mild type of septicæmia with urinary-tract infection after furunculosis. He believed that considerable benefit followed the use of **Autogenous Vaccines**, but the benefit proved lasting only when these had been administered intravenously. Hill,⁶ in a study of nephritis among children, came to the conclusion that inflammation of the kidneys is usually due to some acute toxic condition, and that in nearly a quarter of his cases an attack of acute tonsillitis had preceded the onset of the nephritis. Bierring,⁷ in interstitial cases, has noted a distinct familial tendency. Barber⁸ observes that interstitial nephritis in children is of insidious onset, and, in addition to stunting the growth so as to produce dwarfism, may cause distortion of the bones somewhat similar to that of rickets. Barach⁹ made a series of observations upon 57 athletes before and after prolonged violent exertion, and found that 77 per cent showed albuminuria, while 71 per cent passed blood and casts in the urine. This might last for as long as three weeks after excessive exertion. Foerster¹⁰ noticed that hæmoglobinuria appeared in German soldiers, who were apparently quite healthy, after very strenuous marching.

Uræmia.—Attention is drawn by Vidal, Weill, and Vallery-Radot¹¹ to the great difference in prognosis which is found between chronic nephritis cases in which the symptoms are due to chloride retention, and those in which nitrogenous retention (uræmia) is responsible for symptoms. The latter type of cases always inspire anxiety. These authors hold that by estimating the proportion of urea in the blood it is possible, even when the azotæmia is latent, to detect the accumulation of urea in the organism and to establish the duration of the disease with a precision rarely attainable in clinical medicine. Subjects of this type of Bright's disease who reach 1 grm. of urea per litre of serum without any remissions, almost always die within an outside limit of two years. When the proportion of urea oscillates between 0.5 grm. and 1 grm. per litre the course of the disease may vary; sometimes the urea returns to normal after a time; sometimes it remains between these limits for years without the patient's state undergoing any notable deterioration; this amount should merely be regarded as a warning. Above 1 grm. per litre they consider that the patient is approaching the terminal phase, which is nearer the higher the proportion of urea in the blood. The anæmia accompanying this azotæmic nephritis has been investigated by Aubertin and Yacoel¹²; in moderate cases (urea below 1 grm. per litre) they found a reduction of red blood-corpuscles to between 3,000,000 and 4,000,000; and in the terminal phase the anæmia took on some of the characters of pernicious anæmia, with high colour index and a reduction of erythrocytes to 1,000,000 or even less; there was generally a slight increase of white corpuscles, with considerable relative polynuclear leucocytosis. Chabanier and Galhardo¹³ publish researches on non-urea nitrogen of the blood, by which they consider they establish a parallelism between increasing amounts of urea and of the group of other nitrogenous substances to which uræmic manifestations are due.

TREATMENT.—In the treatment of acute nephritis Petren,¹⁴ in addition to rest in bed, lays most stress upon diet, which he limits to **Cream, Milk, and Water** for the first four or five days, subsequently adding other foodstuffs that consist largely of fat and carbohydrate—e.g., bread, butter, and porridge; later, green vegetables, and still later, eggs. He considers it a good plan, if the symptoms do not pass away soon, to recommence with cream, milk, and water, and repeat the cycle. He also, even in cases with no cedema, restricts the salt intake as much as possible. Hingston Fox,¹⁵ in cases of albuminuria occurring in pale, rapidly growing persons with headaches but apparently without organic disease of the kidneys, recommended the administration of

Calcium Lactate in 60-gr. doses taken in the evening. Box,¹⁶ in cases of *chronic parenchymatous nephritis* with great œdema, finds much benefit to accrue from following out the scheme of diet containing a considerable amount of protein, as recommended by Epstein in such cases. **Epstein's High-protein Diet** consists of : protein 120 to 240 grms. ; fat 20 to 40 grms. ; carbohydrates 150 to 300 grms. The articles used are lean veal, lean ham, whites of eggs, oysters, jelly, Lima beans, lentils, split peas, mushrooms, rice, oatmeal, bananas, skimmed milk, coffee, tea, and cocoa. Of fluid, 1200 to 1500 c.c. are allowed, and the amount of salt is in quantity enough to make the food palatable. Under this régime the urine rose in one case during six weeks from 27 to 100 oz. daily. In granular kidney, however, the established routine of diet, by cutting off protein and extractives, should still be followed. Symes¹⁷ is in agreement with the benefit to be derived in cases of chronic parenchymatous nephritis from Epstein's protein diet or from **Karrell's Diet**. The latter consists of 1½ pints of skimmed milk daily with 6 ounces of coffee ; this is continued for one week, then stewed fruit, bananas, rice, arrowroot, cereals and cream, toast, vegetables, and sugar are added ; later also eggs and meat. No salt is allowed, and the fluid, as mentioned, is restricted to about 1½ pints daily.

In cases with nitrogen retention, however (*chronic interstitial nephritis*), it is necessary to allow 2500 to 3000 c.c. of fluid (4 to 5 pints), and to limit the nitrogenous intake to 50 grms. of protein. This is met by such a **Low-protein Diet** as the following :—

Breakfast.—Porridge of 2 oz. oatmeal, bacon, toast, and tea.

Lunch.—Milk pudding or vegetables ; bread and butter 3 oz. ; jam, fruit, and sugar.

Dinner.—Vegetable soup ; fish, meat, or fowl 3 oz. ; potato 3 oz. ; fruit ; sugar.

Sugar is given plentifully to raise the caloric value of the diet and spare nitrogen katabolism. Articles to be *excluded* are peas, beans, asparagus, onions, rhubarb, strawberries, condiments, meat extracts, alcohol, and tobacco.

Christian¹⁸ enunciates the general principles that when œdema is present we should restrict salt and fluid intake, and increase elimination ; and that when uræmic manifestations threaten we should reduce protein intake. He strongly advocates **Bleeding** as the most effectual method for elimination of toxic substances.

The practice of **Decapsulation of the Kidneys** and of **Nephrotomy**, the former of which was recommended and carried out first some twenty years ago by Harrison and Edebohls, is discussed, and its recent literature summarized, in *Medical Science*.¹⁹ It has been found experimentally that there is less anastomosis after this operation than before it between the renal and somatic vessels, and therefore the procedure is not a cure for chronic Bright's disease. In chronic interstitial disease it is useless and contra-indicated ; in children suffering from subacute parenchymatous nephritis it may be of some benefit, but does not abolish albuminuria. The decapsulation, if it is to be done, should be performed on both kidneys at one time, as soon as medical treatment has proved ineffectual. In acute septic infection (the right kidney being the more frequently attacked) immediate nephrotomy should be performed. Hill²⁰ considers that the operation should only be performed in extreme cases, when there is a large amount of œdema present.

WAR NEPHRITIS.

The later stages of so-called war nephritis have been studied by Howard and Robertson.²¹ They point out that while some authors have regarded this as a special disease, the general consensus of opinion now is that the unusual

number of cases of acute nephritis that occurred in the various armies overseas represent simply a wide variety of the clinical manifestations of this disease as occurring in civil life. They record their observations in 57 cases invalided back to America at a period several months (average four months) after onset. Of these, one half had completely recovered, one quarter developed apparently permanent chronic nephritis, and in one quarter the issue was still doubtful. Even in the patients who had apparently recovered, a moderate diminution of the kidney efficiency, as tested by phenolsulphonaphthalein, was found; the result in this test generally lay between 40 and 60 per cent instead of the normal 70 or 80 per cent output. The blood-pressure in about half the cases was 120 to 140 mm. of mercury; in 12 cases it remained over 140; this they looked upon as the most important indication of the effects left by the disease. Most cases showed a slight degree of anæmia, the red-corpuscle count being usually 4,000,000 to 5,000,000. Very similar results have been recorded by Toennissen, who carefully examined 254 German cases (*see MEDICAL ANNUAL*, 1920, p. 246), and by McCordick and Robbins,²² who analyzed the records of 2490 returned Canadian soldiers. The latter observers regard war nephritis as a mild type, generally with 50 per cent at least of cases progressing favourably to a cure. Gerhardt,²³ in 100 cases, found the outlook even more favourable; while the stay in hospital varied from two to thirteen months, he found that in the end only 10 per cent passed over into chronic nephritis. Cesa Bianchi²⁴ found that in Italian army cases there was little interference with the functional efficiency of the kidneys, and that cases made a speedy return to normal health. Merklen and Desclaux²⁵ examined 26 men who had been temporarily discharged from the French army on account of chronic nephritis, and found that 17, or 65 per cent, still showed various symptoms of chronic nephritis after a lapse of one year; but these figures are obviously not comparable with those already mentioned, because the cases of Merklen and Desclaux were all apparently severe at the beginning of the year of probation.

The connection between trench fever and war nephritis is discussed by Lloyd,²⁶ who considers that trench fever in France was the exciting cause of war nephritis in a considerable number of cases, purely on account of its relative prevalence among febrile diseases, but that there was no specific connection between the two. Like most others who have written lately on the subject, he does not consider trench nephritis a disease *sui generis*. Bennett and Frankau²⁷ record 16 cases of soldiers in whom hæmaturia or hæmoglobinuria occurred with a temperature chart very similar to that of trench fever; the bladder in several cases was examined by cystoscope and showed congested or hæmorrhagic areas; these cases may be similar to those described by Foerster above.

REFERENCES.—¹*Deut. Arch. f. klin. Med.* 1919, Oct., 331; ²*Lancet*, 1920, i, 868; ³*Brit. Med. Jour.* 1919, ii, 662; ⁴*Lancet*, 1920, ii, 546; ⁵*N. Y. Med. Jour.* 1919, ii, 1009; ⁶*Jour. Amer. Med. Assoc.* 1920, ii, 596; ⁷*Iowa State Med. Soc. Jour.* 1920, Jan. 1 (abstr. in *Jour. Amer. Med. Assoc.* 1920, i, 419); ⁸*Lancet*, 1920, i, 18; ⁹*Amer. Jour. Med. Sci.* 1920, March, 398; ¹⁰*Munch. med. Woch.* 1919, 554; ¹¹*Med. Press and Circ.* 1919, ii, 323; ¹²*Presse méd.* 1920, July, 461; ¹³*Ibid.* Sept., 653; ¹⁴*Brit. Med. Jour.* 1919, ii, 662; ¹⁵*Lancet*, 1920, i, 869; ¹⁶*Brit. Med. Jour.* 1920, i, 356; ¹⁷*Ibid.* 494; ¹⁸*Jour. Amer. Med. Assoc.* 1920, i, 1615; ¹⁹*Med. Science*, 1920, April, 50; ²⁰*Jour. Amer. Med. Assoc.* 1919, ii, 1747; ²¹*Amer. Jour. Med. Sci.* 1919, Dec., 844; ²²*Bull. Canad. Army Med. Corps*, 1919, 122; ²³*Munch. med. Woch.* 1919, 145; ²⁴*Policlinico.* 1919, Oct., 1208; ²⁵*Bull. Soc. méd. Hôp. de Paris*, 1919, 434; ²⁶*Lancet*, 1919, ii, 610; ²⁷*Quart. Jour. Med.* 1920, Jan., 106.

NEPHRITIS, PURPURIC, IN CHILDREN. (*See CHILDREN, DISORDERS OF THE URINARY SYSTEM IN.*)

NERVES, PERIPHERAL, SURGERY OF. (*See also CAUSALGIA.*)*J. Ramsay Hunt, M.D.*

Difficulties in the Diagnosis of Nerve Function.—Forrester-Brown¹ draws attention to various small points which, when overlooked in the examination of a case of peripheral nerve injury, lead to errors of diagnosis in both directions: either by making the observer miss altogether the degree of injury to a particular nerve; or by making him conclude that recovery has taken place as the result of an operation, when the progress was really due to some other cause.

Patient's Mentality.—The difficulties are much increased if the patient, owing to mental inertia, or some other reason, refuses to take an intelligent interest in his own case, as all the evidence of nerve function is obtained through the medium of the patient's answers and actions. Some in their anxiety will (consciously or unconsciously) simulate recovery.

Sensory Difficulties.—It must be remembered that when a limb is cold, sensation is much less acute. Thus, in cases of recovering epicritic sensation, where there are still punctate areas of anæsthesia, if the patient's hand is cold, he may be unable to feel light touch at all or will localize it wrongly, whereas he may have responded accurately on a warm day; and this accounts for the variations from day to day in the sensory charts of a recovering nerve case. For this reason the man should always soak his hand in warm water for about twenty minutes before the examination. The patient's eyes must be kept closed while sensation is being tested, as he is apt to confuse the visual stimulus with that of touch, especially if he is anxious for improvement.

Sensory Errors.—When testing pin-prick, the pressure of the pin should always be accompanied by that of the pad of the observer's finger; otherwise the patient will find it hard to distinguish between the pressure of the pin and its painful stimulus, with much consequent waste of time. The pressure sensation evoked by the pin is part of the deep pressure sense, and dependent on different fibres from those responsible for the epicritic pain sense.

In testing Tinel's sign, care must be taken not to be misled by tingling from an adjacent nerve, as in so many regions two or more have an identical course—e.g., the ulnar and internal cutaneous in the upper three-fourths of the arm. By asking the patient to mark out the peripheral distribution of the tingling, this error is avoided.

Muscle tenderness is sometimes hard to tell from nerve tenderness where the nerve runs through the muscles it supplies, as the ulnar does in the palm of the hand.

Difficulties in Motor Diagnosis.—The motor function of a nerve is the most difficult to test when it is impaired, because the movement characteristic of most muscles can be imitated by the combined action of neighbouring muscles; or if the muscle is too weak to move the joints, and the observer feels its belly for evidence of contraction, he may be misled by the tightening of the fascia over the paralyzed muscle, due to the pull of other muscles connected with that. This last difficulty arises particularly in reference to the pronator radii teres and flexors of the wrist, which all arise from the walls of the same compartment of the deep fascia of the forearm. Similarly the fascia is drawn tight over the extensor communis by contraction of the carpal extensors, and this closely imitates a contraction of an atrophied extensor communis itself.

When a muscle is weak or paralyzed, the brain stimulus, like the electrical one, is apt to overflow to all the neighbouring muscles, to the whole limb, or even to the whole body, and these widespread disturbances mask any small contraction of a weakened muscle.

Abnormal Distribution of Nerves.—These cases are impossible to diagnose

with certainty before operation, and they are liable to be reported as rapid recoveries, unless they are early and carefully examined after operation. In the Edinburgh War Hospital several cases have been seen where the median nerve supplied all the intrinsic muscles of the hand, though not the whole ulnar skin area. One case was seen where some of the median muscles were supplied by the ulnar, though again not its skin distribution.

Observations on 500 Cases of Injuries of the Peripheral Nerves at U.S.A. General Hospital No. 11.

Sensory Phenomena.—Frazier and Silbert² state that they disregarded the theory of Head and his well-known classification of 'epicritic' and 'protopathic' sensory loss, stating that the experiments of Trotter and Davies and of Boring proved the fallacy of this theory. Furthermore, the clinical observations from the wealth of material provided by the four years of war may be cited in refutation of Head's classification. Cobb, from his study of the problem in their clinic, concluded that dissociations of sensation due to peripheral nerve lesions arose from comparing stimuli not only quantitatively different but qualitatively unequivalent. By varying the quantitative values of the stimuli, dissociations of sensations could be produced almost at will. In short, they are artefacts due to lack of proper standardization of the examination. If the limb was cold at one examination and warm at another, there would be a difference of 0.5 to 2.0 cm. in the ulnar, and even 5 cm. in the sciatic distribution. Upon the adoption of standardized algesimeters and a uniform technique, it was found that in the examination of an individual case by different members of the staff the sensory charts were precisely similar.

Electrical Examination.—The loss of skin sensibility to faradic current is fairly good evidence of complete interruption. Tinel's observation that the return of skin sensibility is the earliest sign of nerve regeneration has been confirmed by the examinations in this clinic. Occasionally the loss of skin sensibility is incomplete in cases proved at operation to be complete interruption. This phenomenon has been attributed to the presence of anastomotic communications between the nerves below the level of the lesion. Faradic response may be lost even in incomplete and mild lesions, such as those of moderate contusion, and is therefore of little value in a decision for or against operation. With but one exception in the operative series, and in but three of all other cases, voluntary motion returned before that of response to the faradic current.

Stimulation by galvanism applied over the course of the damaged nerve uniformly fails to give a response in the muscles below the level of the injury. The following deductions are drawn from the application of galvanism to the muscles supplied by the damaged nerve: The maximum response is usually over the tendon of the muscle or at the junction of tendon to muscle belly, and not, as in the normal muscle, at the motor point. The rapidity of contraction is the best guide to the degree of degeneration; the slower the reaction the more complete the degeneration. Tetanic response is observed occasionally, but its significance is not clear. The reversal of polarity is the most valuable of all phenomena. Though not invariably, yet in the majority of cases reversal signifies anatomical interruption. Reversal of polarity is occasionally seen in normal muscles.

Trophic and Vasomotor Disturbances.—Trophic and vasomotor disturbances in peripheral nerve lesions are frequently observed, but are of comparatively little practical importance. Capsular and muscle fibrosis are the most serious complications.

TREATMENT.—While it has not been possible to take up the technical details as applied to individual nerves, a summary is given of the principles which

governed the authors in dealing with the problems applicable to all. Liberation or neurolysis has been given preference, in the absence of a complete anatomical division or a neuroma in continuity, when after excising all scar tissue and laying bare the nerve-sheath there is a quick response to faradism. Resection and suture are essential when neurolysis is unsuitable. Resection must be carried central- and distal-ward until healthy scar-free fasciculi are exposed.

In bridging defects, the nerve transplant must not be employed until advantage has been taken of every other reasonable measure: to wit, nerve stretching, immediate or continued (as with sutures through bulbs), mobilization, transposition (as of ulnar and musculospiral), and in exceptional instances lateral implantation suture (as ulnar or musculospiral into median).

When these fail, a nerve transplant is justifiable, the autotransplant being the first choice, and homotransplant (preserved in vaseline, liquid petrolatum, or 50 per cent alcohol) the second choice. For the autotransplant, the musculocutaneous or sural nerves of the leg, or the radial or internal cutaneous of the arm, may be selected on the basis of convenience.

In nerve suture it is equally important to know what one ought to do. In this category are included suture at a distance, the flap operation, bilateral anastomosis (as recorded by Hofmeister), and tubulization. Sharp clean dissection careful hæmostasis, the approximation of healthy fasciculi without undue tension, represent the tripod upon which the success of nerve suture rests.

Tendon transplantation should be employed when suture fails, and is particularly appropriate in residual palsies of the posterior interosseous with inability to extend wrist or fingers, and in anterior tibial palsies with resulting foot-drop.

The after-treatment should include: (1) Enforced fixation for a period of four to six weeks, with gradual straightening of the limb; (2) Massage and galvanism until voluntary movement returns; (3) Exercises varied according to the muscles involved and with a view of sustaining the interest of the patient.

Results of Bridging Gaps in Injured Nerve-trunks by Autogenous Fascial Tubulization and Autogenous Nerve-grafts.—It is now a surgical commonplace that the primary destructive effects of the missiles of modern warfare, the secondary slow destruction caused by prolonged suppuration, and the massive production of dense scar tissue, have together rendered the operative repair of injuries of peripheral nerve trunks an exceedingly difficult feat in many cases. Where end-to-end suture has been considered mechanically impossible, many alternative procedures have been recommended and practised during the past five years. At the present time all methods of bridging gaps in injured nerve-trunks have fallen into disrepute, but it cannot be said that the condemnation of such procedures is universal. More particularly, the use of autogenous, or even homogenous, nerve-grafts is still considered by many to be a justifiable and satisfactory method of repair. In a paper by H. Platt³ is presented a study of the results of a series of operations in which autogenous nerve-grafts combined with fascial tubulization, and tubulization alone, were used. In a total of 430 peripheral-nerve operations performed in his services between March 1, 1915, and Oct. 31, 1919, 46 explorations revealed complete lesions in which end-to-end suture was considered at the time to be impossible of attainment. In 15 instances the gap in the injured nerve was bridged by a combination of an autogenous nerve-graft and fascial tubulization, in 10 cases by fascial tubulization alone, and in 1 case by an autogenous vein-graft—26 operations in all. His conclusions are as follows:—

In 18 operations in which fascial tubulization combined with autogenous nerve-grafts, fascial tubulization alone, and autogenous vein tubulization (one case), were used, there was a complete absence of any clinical sign of recovery. The shortest period over which observations were made was four, the longest

twenty-six, months. Secondary exploration in four cases showed complete silence of the nerve-trunk, to direct faradic stimulation. End-to-end suture was accomplished in all after excision of the bridged segment. At the re-exploration operations, partial or complete obliteration of the lumen of the fascial tube was noted. In two specimens examined histologically, one, a tubulization alone, showed obliteration of the lumen of the tube by fibrous tissue in which no nerve-fibres could be found. In the second, a graft and tubulization combined, nerve-fibres were present in the centre of the obliterated tubule eighteen months after the operation. There was no sign of continuity between the proximal and distal ends through this strand of nerve-fibres. The early re-exploration of all graft and fascial-bridge operations is advisable.

The futility of bridging nerve defects by means of nerve-flaps is also emphasized by B. Stookey.⁴ He concludes that repair by this means has not been definitely supported clinically, as evidenced by a critical study of the reported cases. Experimentally it has been shown that nerve-flaps do not serve as conducting paths for the down-growing neuraxes. Nerve-flaps, whether central or peripheral, are merely degenerated partial nerve-segments. Continuity and union of neuraxes does not take place at the point of suture. By the formation of nerve-flaps from the central stump, a portion of the nerve from which neuraxes must grow is removed. Distal as well as central flaps may sever muscular branches. By reversing the flaps they are taken out of their field. Thus the down-growing neuraxes are prevented from reaching the muscles through these muscular branches, even were regeneration to take place. The nerve-flap method to bridge nerve defects should be discarded in peripheral-nerve surgery.

The Treatment of Denervated Muscle and the 'Disuse' Theory.—This forms the subject of an interesting discussion by J. N. Langley.⁵ The striking fact is that from 1849 to 1915 denervated muscles in man have been generally, though not universally, caused to contract by electric currents, on the theory that this treatment prevented or delayed atrophy, without any definite evidence being offered (so far as the author has been able to find) of a successful result, and without any further serious experiments on animals. Recently some experiments on animals have been made by Langley and Kato. These deal with the effect of treatment on the atrophy of muscle; since no certain benefit was found, it is eminently desirable that treatment in man should not be governed by theoretical conclusions, and that the effect of treatment should be observed with an open mind.

There are one or two other points on the treatment of denervated muscle which deserve mention. It is known that in such muscle connective tissue readily forms. This tissue when first formed is jelly-like, and the writer agrees with those who think it important that passive movement should be carried out at the earliest possible moment, in order to stretch this tissue and prevent adhesions of the muscles and joints. The theory that muscle is injured by moderate extension and flexion is, he thinks, erroneous; such injury may occur when parts of the muscle are so fixed by connective tissue that stretching breaks the muscle fibres. In the later stages the blood-supply to the muscle probably diminishes, and it seems reasonable to suppose that an increase of blood-supply will benefit it. A simple and effective way of doing this is the warm bath commonly used. Whether any other treatment is necessary is, he thinks, doubtful, but as an additional measure he considers there is more to be said for massage than for electrical stimulation. In conclusion, he says that the treatment of denervated muscle is still in the experimental stage.

Electrical Stimulation of Nerves at Operation.—H. M. Burke⁶ relates the experience gained in some eighty cases by this method. He uses a Lewis Jones'

sledge coil, which is portable and can be placed out of the way of the operator and his assistants. Two long cables are attached to the terminals of this machine, and their peripheral ends, for about $3\frac{1}{2}$ or 4 feet, are cased in good rubber tubing made continuous with the insulation of the bipolar electrode. The rubber ends can be boiled in the sterilizer, and thereafter form part of the sterile apparatus for handling by the surgeon and others who are 'clean', while the central end above the rubber tubing is 'unclean', and can be freely handled by the electrologist, neurologist, or such assistant as may be appointed to control the coil. The electrode found most useful is a small telephone plug, with the two pins bent towards each other. Around its junction with the cables rubber tape is tightly wound, and the joints sealed with rubber solution.

Object of the Examination.—The functions of the nerve which it is possible to investigate are those of excitability and conductivity. When stimulation of the nerve above the lesion leads to muscular contraction, this is mainly evidence of physiological continuity of the nerve through the area of injury—that is to say, a demonstration of conductivity. The excitability of the central end is not likely to suffer to a great extent. Contraction obtained by stimulating below the lesion is mainly evidence of the excitability of the peripheral portion of the nerve-trunk. It is also a proof of conductivity in this lower part of the nerve; but the extent to which this must be considered is discussed below. It is necessary, therefore, to examine the result of stimulation of the nerve-trunk above and below the level of the lesion, both before and after dissection of the nerve from scar tissue and adhesions.

Method.—A small bipolar electrode was adopted for general use.

Strength of stimulus: The coil is adjusted to yield the current which experience has shown to be sufficient to produce an obvious contraction in an average normal case. Minute measurement is not practicable. The general idea is to use the constant strength and to note the results obtained under varying conditions.

Method of stimulation: The nerve-trunk, having been isolated in its undamaged portion above the lesion, is gently lifted on a hook so as to be free of surrounding structures. The electrode is applied so that the two pin terminals lie evenly and lightly on the trunk, the current is turned on, and the result noted. The observation is rapidly repeated with the electrode applied to different aspects of the nerve surface, in order to pick out separate muscles with greater accuracy. The same observations are made for the portions of the nerve below the injury. Dissection is then finished, and, if the nerve is found to be in anatomical continuity, the tests are repeated on the liberated nerve. It is necessary to have good exposure of hand, foot, or other part in which movement is to be sought for. This part need not be 'clean', unless the surgeon himself is making the observation. The examination of the result of stimulation must be done with scrupulous care by someone accustomed to the business, so that a minute muscular contraction is not missed, nor the nature of a movement misinterpreted.

The author's conclusions are that every case should be tested, as a fair number of decisions are made easier by the information obtained, and an unnecessary section of an undivided nerve may thus be avoided. Conductivity is conclusive evidence of physiological continuity of nerve-fibres, as also is excitability below the lesion. Improvement in conductivity or in peripheral excitability following immediately after neurolysis is suggestive of only slight compression and possibly chemical nerve-block. Absence of conductivity and of excitability, even after neurolysis, is not conclusive evidence of division.

(See also ELECTROTHERAPEUTICS, p. 38.)

Spontaneous Regeneration of Peripheral Nerves.—Perthes⁷ has studied this question, and recognizes with Foerster two groups of cases: (1) Those in which there is rapid restitution of function, in which all of the muscles in the affected nerve distribution show evidences of returning function at the same time, and this gradually progresses to complete restoration of power; and (2) Those with a more gradual return of function, one muscle after another manifesting returning function; this mode of restoration follows a certain definite descending course, those muscles which are nearest the nerve centres recovering first. Perthes holds that in the milder type (1) the injury is a comparatively slight one, and degeneration of the nerve-fibres has not taken place. Among the lesions producing this type may be mentioned concussion, stretching, pressure, etc. In type (2), on the other hand, degeneration of the nerve-fibres has taken place, and restoration of function is only possible after the slower processes of nerve regeneration.

REFERENCES.—¹*Brit. Jour. Surg.* 1920, April, 495; ²*Surg. Gynecol. and Obst.* 1920, Jan., 50; ³*Brit. Jour. Surg.* 1920, Jan., 384; ⁴*Surg. Gynecol. and Obst.* 1919, Sept., 287; ⁵*Brit. Med. Jour.* 1920, ii, 239; ⁶*Lancet*, 1920, i, 761; ⁷*Munch. med. Woch.* 1919, Oct. 24, 1219.

NERVOUS SYSTEM, CENTRAL, SYPHILIS OF. (See SYPHILIS OF THE CENTRAL NERVOUS SYSTEM.)

NERVOUS SYSTEM, CENTRAL, UROLOGICAL FINDINGS IN DISEASES OF. (See UROLOGICAL FINDINGS IN DISEASES OF CENTRAL NERVOUS SYSTEM.)

NEURALGIA.

J. Ramsay Hunt, M.D.

TRIGEMINAL NEURALGIA.

Harvey Cushing¹ reviews the major trigeminal neuralgias and their surgical treatment, based on experiences with 332 Gasserian operations.

DIAGNOSIS: VARIETIES OF FACIAL NEURALGIA.—There may be a variety of painful disorders of the nerves supplying the face—disorders which are designated as 'neuralgic', but which must be clearly distinguished from the more common trigeminal neuralgias. As some of these allied conditions may be exceedingly distressing, and may lead the unwary, as they have occasionally led the writer, into a needless and futile Gasserian operation, it is well to bear them in mind, so that they may be recognized if possible. Five different types may deserve consideration: (1) Those ascribed to the sphenopalatine ganglion; (2) Those secondary to zoster; (3) Those attributed to the geniculate ganglion; (4) Those accompanying certain cases of convulsive tic; and (5) Those due to an involvement of the trigeminus by tumours. Finally (6) An attempt has been made to describe what are considered minor trigeminal neuralgias as distinguished from major trigeminal neuralgias.

1. *The Neuralgias Accredited to the Sphenopalatine (Meckel's) Ganglion* (Sluder's neuralgia).—Greenfield Sluder has called attention to the fact that the bony partition separating the accessory sinuses from the sphenomaxillary fossa may be extremely thin or even defective. On this basis he believes that inflammatory processes within these cells may in some cases so congest the tissues of the fossa as to produce "a symptom-complex partly neuralgic", which he attributes to involvement of the sphenopalatine ganglion. He describes the symptoms as follows:—

"The neuralgic picture is pain in the root of the nose and in and about the eye, in the upper jaw and teeth (sometimes lower jaw and teeth), extending backward under the zygoma to the ear, frequently making earache and pain in the mastoid; but severest often at a point 5 cm. back of the mastoid,

extending thence to the occiput, neck, shoulder-blade, shoulder, breast, and, when severe, to the arm, forearm, hand, and fingers; with sometimes a sense of sore throat on that side. Rarer additions to this picture are itching of the skin of the upper extremity, taste disturbances (parageusia), a sense of stiffness and muscle weakness in the upper extremity, and fortification scotomata. Mild cases are described as a sense of tension in the face and stiffness or rheumatism in the shoulders. It may appear as constant pain with exacerbations, or it may stop and reappear cyclically as a migraine; or it may stop and reappear with stabbing sharpness as a 'tic'.

Thus these neuralgias, to whatever anatomical structure they may be attributed, should be capable of differentiation from the trigeminal neuralgias, by the history of presence of sinus infection, by their frequent bilaterality, by their situation and tendency to radiate to neck and shoulder, by the more or less continuous pain, which is not inaugurated by the peripheral stimuli such as occurs with eating, talking, or handling the face, and by the absence of any facial contortions with the paroxysms.

2. *The Post-zoster Neuralgias* (trigeminal and geniculate).—When zoster occurs in the trigeminal skin fields, and the lesion is followed by neuralgia, the discomforts do not, as a rule, tend to spread into the territory of the other divisions, and in this respect these neuralgias differ from the true tic douloureux. The pain, moreover, is described as having a persistent burning character, and thus does not resemble the sharp and paroxysmal attacks of true trigeminal neuralgia. Ordinarily the condition is easily recognized by the history and by the cutaneous scars of the original lesion.

3. *The Neuralgias Accredited to the Geniculate Ganglion* (Neuralgia facialis vera; Hunt's neuralgia).—Particular attention has been paid by Ramsay Hunt to the clinical importance of the sensory radicle of the facial nerve, exclusive of its gustatory function. He has emphasized the fact that discomforts may occur in the auricular skin field, which he attributes to the geniculate ganglion, a structure which is, of course, the homologue of the semilunar ganglion; and he even speaks of "a primary tic douloureux" of the ear among other forms of otalgia. It is quite possible, therefore, that some of these conditions may lead to diagnostic errors and be confused with trigeminal neuralgia, and it gives an additional reason for refraining from the use of the term facial neuralgia as a general designation for the various forms of pain in the face.

The otalgias which result from geniculate disease are said to be at times very severe, and, what is important in our present connection, the discomforts may actually spread forward over the trigeminal field and down the neck and shoulder, so that they may easily be confused with other pseudotrigeminal neuralgias.

4. *Painful Tic Convulsif*.—This, so far as the author knows, is an undescribed condition. He has seen three definite cases. The spasmodic contracture of the face which characterizes motor tic may in aggravated cases be accompanied by great pain. Occasionally examples of this condition are seen which so far resemble Gasserian cases that one unfamiliar with the disorder might be led to believe that the condition was actually trigeminal in origin. The deception is the more likely to occur because of the facial contortions and masticatory movements on the involved side which sometimes accompany the paroxysms of true trigeminal neuralgia.

5. *Neuralgias from Tumour Involvement*.—Though comparatively uncommon conditions, these may be due to tumours arising in various places. They may be divided into four groups: (a) The tumours in the cerebellopontile recess, which press upon the trigeminal root; (b) Those involving the ganglion by

direct pressure from above; (c) Those arising in the pterygoid fossa or in the temporal bone, which press against the ganglion from below; and (d) Those arising from the envelopes of the ganglion itself.

6. *The Minor Trigeminal Neuralgias.*—These are multitudinous. They may follow injuries, particularly when nerves have been contused or more seriously damaged. They are particularly common as the aftermath of dental procedures, and the prevalent root infections are a frequent source of neuralgic discomforts. Again, the extension of nasal infections to the accessory sinuses, frontal, sphenoidal, or maxillary, is a common precursor of neuralgia, due unquestionably to some inflammatory involvement of the adjacent nerve-trunks.

The Role of Deep Alcohol Injections in the Treatment of Trigeminal Neuralgia is also discussed by Cushing.² The procedure has its limitations. The relief is but temporary, and with each successive injection a shorter interval of freedom from pain is apt to be secured. This, however, is true of peripheral operations as well, which in the hands of the inexperienced may leave very unsightly scars on the face; but, on the other hand, misplaced alcohol injections may do damage far worse than leaving unsightly scars. Examples of most distressing after-results of these cases appear from time to time, such complications as one rarely sees in the present day after a ganglion operation. Paralysis of the oculomotor nerves is one of the commonest. Locking of the jaw from infiltration, and subsequent fibrosis of the pterygoid muscles, is another frequent occurrence. Paralysis of the motor fifth is usual after injection of the mandibular division, and function may not be regained. Sloughs of the nasal bones, with subsequent ozæna, have been reported, and some of the intranasal injections have been followed by critical secondary hæmorrhages. Still more distressing are the examples of labyrinthine trouble due to the accidental injection into the middle ear. The Eustachian tube is but a few millimetres from the mandibular branch at the foramen ovale, and if sufficient local anæsthetic is added to the alcoholic solution to render the mucous membranes insensitive, the middle ear may become filled with alcohol and a slough result.

Injection of the ganglion was first proposed in 1912 by Härtel, of Bier's clinic, and, considering the fact that the results at best are with rare exceptions little better than after extracranial injections, and that the complications are as bad as, if not worse than, those seen after imperfect Gasserian operations in their worst days, it is certainly time for someone to protest against this blind procedure. In the matter of secondary keratitis alone, Flesch, from his review of the cases, believes that 50 per cent have suffered from eye troubles. Härtel not only reports a case of meningitis, but has admitted to corneal complications in one in every four (25 per cent) of his first 24 cases; whereas certainly not one in ten patients after a sensory root avulsion has any subsequent trouble with the eye.

Flesch mentions among the complications, vomiting, fainting, bradycardia, somnolence, ataxia, collapse, severe headache, fever (40 per cent of cases), stiffness of the neck, cloudiness with increased tension of the cerebrospinal fluid—a so-called aseptic meningitis. Härtel himself warns against the possibility of the mordant entering the lateral cistern of the posterior fossa.

The author's conclusions are that deep extracranial injections of alcohol into the maxillary and mandibular nerve-trunks near their foramina of exit from the skull have completely superseded peripheral neurectomies. In neuralgias limited to one of the two lower divisions, and which may possibly not extend into the other trigeminal areas, alcohol injections represent unquestionably the treatment of choice. When the neuralgia has spread

beyond its original area and come to involve that supplied by the adjacent division, a trigeminal neurectomy must be contemplated; but if no preceding deep injection has been given, it may be useful not only to make sure of the type of the neuralgia, but to give the patient some warning as to what the numbness resulting from the neurectomy may amount to. Deep injections are sometimes useful, furthermore, in determining in doubtful cases whether the syndrome is a true neuralgia of the *tic-douloureux* type or one of the peculiar and rare pseudoneuralgias not amenable to relief either by injections or neurectomies. Even the extracranial injections are not entirely free from risk, and in no cases should they be purposefully pushed to the point of attempting an injection of the Gasserian sheath itself.

With such perfect and permanent results as may be secured to-day by a trigeminal sensory-root avulsion, the mortality of the operation is negligible. In the author's series there have been to date of writing 312 consecutive cases without fatality. The prolonged and repeated use of injections in refractory cases which involve more than one division should be deplored.

Cutting the Sensory Root of the Gasserian Ganglion for the Relief of Trifacial Neuralgia.—The treatment of trifacial neuralgia has varied from the use of simple counter-irritants to the radical procedure of ganglionectomy. According to A. W. Edson,³ division of the root, or the physiological extirpation of the ganglion, appears to be the operation of choice in the radical treatment of trifacial neuralgia. Attention was called to this treatment by Spiller in 1898, and by Frazier in 1901. In their experimental work they proved that if the fibres posterior to the ganglion are divided, regeneration never occurs in the brain-stem. Following Frazier's and Spiller's work, Van Gehuchten presented his investigation, which corroborated their work, and in 1918 Frazier reported a series of cases in which this technique had been employed with gratifying results. The complications attending the various ganglion operations have been serious hæmorrhages, paralysis of the third, fourth, and sixth cranial nerves, frequent paralysis of the frontal branch of the seventh nerve with occasional involvement of the whole seventh nerve, conjunctivitis, and trophic interstitial keratitis.

In operations on 10 cases of trifacial neuralgia in 1917, and in 28 cases in 1918, at the Mayo clinic, two complications have attended the section of the sensory root as suggested by Frazier and Spiller: the occasional paralysis of the seventh nerve, and the trophic interstitial keratitis. When seventh-nerve palsy occurs, it is accompanied by a lagophthalmos, which, in turn, permits undue exposure and dryness of the cornea, resulting in abrasions and the formation of trophic ulcers. Interstitial keratitis may occur independently of paralysis of the seventh nerve; it is very troublesome, and may result in the formation of an opaque cornea.

It was found (Hutchinson) that the seventh-nerve paralysis may occur as the result of detachment of the dura from the petrous bone, thus allowing the blood to enter into the small openings leading into the aqueduct of Fallopius; when the paralysis occurs, it occurs immediately. It may be only slight at first, but it becomes complete within a day or two. In four patients with a seventh-nerve paralysis, the dura was not stripped from the petrous bone. The technique employed was that suggested by Frazier and Spiller, in which the root was avulsed with a blunt hook. All of these patients were free from facial palsy until after the fifth day, when it came on gradually, became complete, remained for about six weeks, and then gradually disappeared. It seems probable that the cause of the seventh-nerve paralysis is trauma resulting in small hæmorrhages and œdema of the pons and of the brain-stem. This is further verified by the results obtained when the posterior root is cut and

not avulsed. No seventh-nerve paralysis occurred in twenty-six successive cases since this change was made in the technique.

It is probable that sympathetic fibres pass to the eye after entering the trigeminal nerve through the Gasserian ganglion, and, as in the division of the sensory root they are not injured, the danger of ocular disturbance by this operation is lessened. The trophic influence of the Gasserian ganglion on the eye may possibly depend on the integrity of these sympathetic fibres.

In the author's observations, it was found that whenever trophic interstitial keratitis occurred, one of two things happened at the time of operation; either the dura propria had been split so that the ganglion was greatly exposed, or it was necessary to insert a large pack to control bleeding, this causing pressure on the ganglion. It was noted also that if only the posterior margin and root were exposed, there was never any immediate keratitis.

The principles of the physiological extirpation of the ganglion laid down by Spiller and Frazier have been carried out in the foregoing operation, except that the posterior root has been exposed without injury to the ganglion and particularly to the cells supplying the ophthalmic branch, thus decreasing the frequency of trophic interstitial keratitis; and furthermore the posterior root is cut instead of avulsed, in this manner avoiding the occasional seventh-nerve paralysis.

Palliative Treatment versus Radical Treatment of Trifacial Neuralgia.—A. W. Edson⁴ reviews 318 cases treated at the Mayo clinic from January, 1910, to October, 1919. Of these, 186 were males and 132 were females. At the time of admission the average age was fifty-five years, the average duration of trouble seven years, and the onset, in the majority of cases, between thirty-five and fifty-five years. In 13 cases the onset of the trouble occurred after the age of seventy.

Eight hundred and five alcohol injections were administered in the series of 318 patients, which is an average of 2.5 injections for each patient. During the course of the treatment, either at the clinic or elsewhere, there were 17 drainages of the antrum, 71 extractions of teeth, 11 nasal operations, 11 maxillary operations, and 93 nerve avulsions, a total of 203 palliative operations in addition to the 805 alcohol injections. Of the 318 patients, 95 had radical operations, 9 ganglionectomies, 4 removal of Gasserian ganglion tumours, 49 avulsions or resection of the posterior root, and the posterior root was cut in 33. Five were re-operated for trifacial neuralgia, probably not because of regeneration of the posterior root, but because a complete division of the root was not effected at the primary operation. Four patients died, 2 from hæmorrhages, 1 from meningitis, and 1 from exhaustion and senility.

Ninety patients have had the radical operation with complete relief; the remaining 228 are still seeking relief by temporary methods. The author is convinced that the radical operation is indicated in operable cases after one or two alcohol injections, in preference to continuing the palliative procedure indefinitely.

NEURALGIA OF THE HEAD.

Neuralgia of the head and its treatment by **Bruising of the Painful Points**, is described by Janowski.⁵ He considers it an excellent and an infallible mode of treatment for this form of headache. The best results are obtained by this method without other supplementary forms of manipulation. During the first few days this procedure is quite painful. It is recommended that daily treatments be given in series of six, followed by a rest interval of two or three days. In intractable cases of many years' duration, from five to nine such series of treatments may be required.

LUMBAR NEURALGIA AND SACRALIZATION OF THE 5TH LUMBAR VERTEBRA.

Among the congenital defects of the skeleton, fusion more or less complete of the sacrum with the last lumbar vertebra is now well recognized, and may be associated with neuralgic pain, scoliosis, and pelvic deformities. The relation of this deformity—viz., elongation of the transverse process of the 5th lumbar and attachment to the crest of the ilium—was first discovered by Adams in 1910, and he relieved the condition by resection of the bony process. In 1912 Kleinschmidt reported a case of intractable sciatica of similar origin, and Goldthwait a lumbalgia which he attributed to impingement of the hypertrophic process on the subjacent sacrum. That this malformation is not very infrequent was shown by Rossi, who found it present in 7 of the 400 radiographs of the pelvis taken at random, and in 22 of 800 patients suffering from pain in the lumbar region. Recently Richards in 60 patients with lumbar pain found the malformation in 90 per cent of the cases.

Nové-Jusserand⁶ reports five cases belonging to this interesting group. The onset of symptoms generally occurs between twenty and thirty, in one case as young as the sixteenth year. Pain usually appears spontaneously, and only rarely has followed a fall or other accident. The dominant symptom is pain, and this is associated with scoliosis or a flattening of the back. The pain is lumbar, and may irradiate in the sciatic distribution and the flank. It is unilateral when the deformity is unilateral, and is usually on the same side. Rarely it occurs on the side opposite to the lesion. Occasionally there is muscular atrophy, electrical reaction of degeneration, and anæsthesias in the distribution of the compressed nerves. The usual malformation as shown by the *x* ray is an elongation or thickening of the transverse process of the last lumbar vertebra. This, by pressure upon the subjacent sacrum or ilium, or by partial occlusion of the intervertebral foramen, occasions the symptoms. The radical treatment would consist of resection of the offending bony process. This has been done in a few cases with success. The malformation is in many ways analogous to the 'cervical rib', a congenital malformation of the transverse processes of the lower cervical vertebrae. This condition has been found amenable to the operative procedures of resection.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1920, Aug., 157; ²*Jour. Amer. Med. Assoc.* 1920, Aug. 14, 441; ³*Surg. Gynecol. and Obst.* 1919, Oct., 334; ⁴*Minnesota Med.* 1920, April, 169; ⁵*Presse méd.* 1920, Aug., 7, 537; ⁶*Lyon chir.* 1919, Nov.-Dec.

NEURITIS. Colloidal Sulphur advised in this condition (p. 10); **Paraffin-wax Baths** (p. 16); **Vaccines** (p. 22). (See also MUMPS.)

NEW-BORN, CEREBRAL HÆMORRHAGE IN. (See CEREBRAL HÆMORRHAGE.)

NOMA.

E. Graham Little, M.D., F.R.C.P.

Elving¹ records an interesting case of noma of the hand in a boy, age 5, in whom the disease had begun in the right thumb and extended rapidly above the wrist, entailing an amputation of the hand. Vincent's spirillum and fusiform bacilli were found in the wound.

REFERENCE.—¹*Med. Record*, 1919, Oct. 25, 701 (abstr.).

NOSE, DISEASES OF. (See also NASAL ACCESSORY SINUSES; OZENA.)

A. J. Wright, M.B., F.R.C.S.

Modifications of the Bacterial Flora of the Nose.—Plugging the nasal cavities is sometimes necessary, but should be avoided where possible owing to the risk of septic complications. Caldera and Santi¹ have carried out some suggestive experimental work. The nasal cavities of a number of dogs were plugged

under aseptic conditions with sterile gauze. The nasal secretions were examined after a period of twenty-four or forty-eight hours' plugging, and it was found that there was an enormous increase in the number of organisms present, and that these secretions produced local inflammatory lesions when inoculated into rabbits. The secretions from normal dogs do not produce a similar reaction. The impregnation of the gauze with iodoform prevented this growth of organisms, and it would therefore seem wise to use this medicated gauze rather than plain gauze when plugging is necessary.

Caldera and Desderi,² as the result of a series of experiments in which plate cultures were made from the nasal cavities of healthy individuals under varying conditions, found that while, in cities, large numbers of organisms were present in the anterior regions of the nasal cavities, these diminished in numbers when the individuals lived in the country, particularly at a high altitude. Dryness of the atmosphere tends to increase the number of organisms present.

Rhinogenous Headache.—Gallusser³ states that many cases of headache, for which no cause can be discovered, have their origin in an unsuspected nasal disease giving rise to no other subjective or objective signs. Features which should suggest a nasal origin are a frontal headache with sense of oppression, and occasional paroxysms of severe pain. The pain develops either on rising in the morning, or after sneezing, bending over, or emotional stress. Pain on pressure over the internal angle of the eye is often present. Cocaine, applied to the upper region of the nose, frequently relieves the pain at once. Two cases were entirely cured by amputation of the middle turbinal and intranasal opening up of the anterior ethmoidal cells and frontal sinus, although no pus or pathological condition was found at operation. [It would seem probable that the relief in these cases was due rather to removal of pressure between the middle turbinal and septum than to the opening of the frontal sinus.—A. J. W.]

Local Anæsthesia in Nose and Throat Work.—An investigation of the relative advantages and disadvantages of local anæsthesia in nose and throat work has been carried out by a committee appointed by the Section on Laryngology, Otology, and Rhinology of the American Medical Association.⁴ In considering this report, it must be realized that local anæsthetics are more widely used as an alternative to general anæsthetics in the United States than in this country. The investigation was carried out by study of the literature, the collection of clinical data from members of the Association, and by animal experimentation. A remarkable similarity exists between the clinical effects and results of animal experimentation. None of the synthetic substitutes are as efficient as cocaine when applied to the mucous membrane. The synthetic products may be freely injected in proper doses, but the injection must be slowly performed. Cocaine should never be injected. Of 20 fatalities recorded, 14 were the result of cocaine and 6 of procaine. Five of the deaths from cocaine were the result of an error in dosage. Death, when it occurs, takes place in two or three minutes. There is no clinical evidence as to whether a preliminary injection of morphia increases or diminishes the risk. The greatest risk is in too rapid injection, or in entering a vein. The danger of post-operative hæmorrhage does not seem to be greater with a local than with a general anæsthetic.

The committee make the following suggestions: All operations should be performed with the patient recumbent. Each operation should be preceded by a hypodermic injection of morphia and atropine. In nose operations epinephrin should be applied first, followed by cocaine and the injection of the synthetic drug introduced slowly. In throat operations a 5 or 10 per cent solution of cocaine should be applied, followed by the slow injection of the

synthetic product. When there may be a suspicion of possible danger, one-fourth of the amount of anæsthetic to be used at the time of operation should be applied, and the patient watched for possible toxic effects. Cases requiring special precaution include those with cardiac disease, exophthalmic goitre, or other disturbance of internal secretion.

REFERENCES.—¹*Arch. ital. di Otol.* xxx, No. 3; ²*Ibid.*; ³*Jour. Amer. Med. Assoc.* 1920, Jan. 17, 214; ⁴*Ibid.* July 31, 315.

ŒDEMA, WAR OR HUNGER. (See DEFICIENCY DISEASES—FAMINE DROPSY.)

OPHTHALMIA NEONATORUM. (See CONJUNCTIVA, DISEASES OF.)

OPHTHALMIC SURGERY. The use of Iodine considered (p. 13). (See also EYE.)

OTITIS MEDIA. (See also MASTOID DISEASE; EAR DISEASE, INTRACRANIAL COMPLICATIONS OF.)

John S. Fraser, M.B., F.R.C.S.

Acute Aural Suppuration in Early Childhood.—Guthrie¹ states that aural suppuration occurs with extreme frequency during the first year of life. Eight different observers who examined the ears at a series of post-mortems on infants have found that otitis was present in 82 per cent. The pus was seldom sterile. Most cases yielded the pneumococcus, while next in frequency came the streptococcus. The close connection between otitis and pneumonia has often been remarked, and it is said that the middle ear is infected in every fatal case of infantile pneumonia. The commonest cause, however, of otitis media is the ordinary 'cold'. Among all the diseases of children probably none is so frequently overlooked as otitis media. The ears should be examined in all infants who suffer from fever of obscure causation. The temperature may be high, or it may not rise above 100°. Pain is evidenced by continuous crying, restlessness, and sleeplessness, and boring of the head into the pillow. Head-retraction, vomiting, and convulsions may lead one to suspect meningitis, until, with the occurrence of perforation, the true nature of the case is revealed. Otoscopic examination does not always assist us to diagnose otitis prior to perforation. We must remember the obliquity of the drum. The meatus is a mere slit, whose walls must be separated by pulling the auricle downwards. Considering the frequency of otitis media in infants, mastoiditis is not a very common complication. When it does occur, the thin outer wall of the antrum breaks down, and a subperiosteal abscess forms above and behind the ear.

TREATMENT.—In the early stages of otitis, dry heat and the use of the well-known Cocaine, Carbolic, and Glycerin Drops, will relieve symptoms, but surgical treatment is more effective. Paracentesis might with advantage be performed more frequently. General anæsthesia is advisable for this small operation.

Otitis Media in Bathers.—Wieder² points out that otitis media may be due to the forcible blowing of water into the middle ear. As they emerge from the water, bathers immediately clasp the *alæ nasi* between the thumb and first finger and blow forcibly in an effort to remove the water contained in the nose and throat. Instead of blowing out the water, as they would do if they left the nose unobstructed by the hands, they frequently drive it directly up into the Eustachian tubes to the middle ear. Most swimmers realize their susceptibility to otitis media, but, not recognizing the *modus operandi*, put cotton into the external auditory meatus to prevent it. Were they instructed to allow the water to run freely from the nose and throat before

making any effort to blow the nose, otitis media would be far less frequent among them.

Scarlatinal Otitis Media.—Bache³ points out that the frequency of otitis media in scarlet fever has been estimated at 15 to 20 per cent by Escherich and Schick, and at 18.6 to 36 per cent by Holmgren. Of 1,395 cases of scarlet fever investigated by Bache, 167, or 12 per cent, developed otitis media. These cases were classified with a view to investigating the seasonal incidence of this complication. It was found that the proportion was lowest in the first and last quarters of the year, and highest in the second quarter. It is noteworthy that the curve of otitis media did not correspond in any way with that showing the frequency of mastoiditis. The average duration of otitis media was thirty days. The incidence was greatest during the first two weeks of the disease, but throughout convalescence the development of otitis media had to be anticipated.

Acute Otitis Media in Syphilitic Patients.—Ary Dos Santos⁴ records the case of a soldier, age 25, who had contracted syphilis two years previously, and developed left acute otitis media as the result of a chill. Shortly afterwards he showed typical symptoms of labyrinthine involvement—namely, deafness, tinnitus, and vertigo. Three days later complete left facial paralysis supervened. Recovery took place under treatment by injections of *Pilocarpine Hydrochlorate* associated with *Iodide of Potassium* given internally.

Chronic Suppurative Middle-ear Disease.—Smurthwaite⁵ states that out of 5000 military cases during the year 1917, 890 were suffering from chronic suppurative ear disease. The majority were only fit for category C. A large number were most of their time in the medical officer's hands for treatment by syringing and drops. This was only marking time, for little short of a mastoid operation would cure such cases, and space and time would not permit this. The majority would have been A men had systematic treatment been carried out in the earliest days of the onset of the disease. Smurthwaite holds that every fever hospital should have an otologist attached, or at least a medical officer who has a fair knowledge of ear diseases. At present these institutions are a fruitful source of ear disease. A man with chronic otorrhœa loses from 10 to 70 per cent value in the labour world. Smurthwaite has examined some hundreds of cases of deafness for pension purposes, and realizes the disadvantage of a man with even a partial loss of hearing. There are many trades in which good hearing is indispensable—e.g., the miner can no longer get work down the pit on account of his loss of hearing, because he may fail to hear sounds which portend disaster. The same applies to many other trades, and the man is finally driven to casual labour. On the other hand, during 1917 Smurthwaite treated 54 cases of acute or subacute otitis media, all of whom left hospital with the discharge ceased, the rent in the drumhead healed, and the hearing restored.

Fulminant Otagenous Osteomyelitis of the Temporal Bone in Children.—Siebenmann⁶ has encountered seven cases, all but one in girls. Six followed acute, and only one chronic, purulent otitis media. The onset was stormy in the midst of apparent health or infectious sore throat or bronchitis, with intense earache and high fever, continuous or of a pyæmic type. All the seven patients died between the ninth and sixteenth days. Even early operation in such cases showed that the destructive process seemed to have skipped certain points to attack points beyond, but this does not imply a blood infection. The bones outside the immediate region were not involved. Operative measures in the author's cases were unable to ward off the fatal pyæmia, although the focus was excised apparently into sound tissue.

Treatment of Chronic Purulent Otitis Media.—As disinfecting agents Callison⁷

advises **Phenol** and **Tincture of Iodine**, also **Acriflavine** and **Mercurochrome-220**. These drugs must be used in a vehicle of fairly high alcoholic content:—

R	Tincturæ Iodi	gtt. xv	Alcoholis	3iv
	Phenolis (95 per cent)	gtt. xv	Aquæ	q.s. ad 5j

Callison recommends a saturated solution of **Nitrate of Silver** to destroy granulations. The ear is carefully cleansed and dried with cotton applicators. Under direct vision, the saturated solution of nitrate of silver is applied on a cotton mop. Few patients complain of pain.

REFERENCES.—¹*Lancet*, 1919, ii, 428; ²*Laryngoscope*, 1920, xxx, 543; ³*Tideskrift for Den Norske Lægeforening*, 1920, June 1; ⁴*Rev. de Laryngol. d'Otol. et de Rhinol.* 1920, May 31; ⁵*Brit. Med. Jour.* 1920, i, 467; ⁶*Cor.-Blatt. f. schweiz. Aerzte*, 1919, 1737; ⁷*N. Y. Med. Jour.* 1920, 1072.

OTOSCLEROSIS.

John S. Fraser, M.B., F.R.C.S.

PATHOLOGY.—Otto Mayer¹ regards otosclerosis as a tumour formation, apparently of hereditary origin, while Wittmaack holds that the focus of new bone formation is the result of venous stasis in the bony canal containing the branch of communication between the tympanic nerve and the small superficial petrosal nerve. Goerke, in criticizing these two views, is strongly in favour of Wittmaack's theory.

Nager² has examined the temporal bones of a deaf and demented female, age 73, and has confirmed the observation of O. Mayer that the pathological changes in otosclerosis strongly resemble those seen in osteitis deformans (Paget's disease). Nager found bony deposit in the annular ligament, and atrophy of the cochlear ganglion cells—i.e., there was a combination of nervous and sound-conduction deafness, the form of hearing disturbance which is found in most cases of Paget's disease.

TREATMENT.—Caldera³ claims good results from the administration of **Adrenalin** in otosclerosis: not only does this remedy diminish the tinnitus, but it even improves the hearing.

REFERENCES.—¹*Centralb. f. Ohrenheilk.* 1920, xviii, 42; ²*Zeits. f. Ohrenheilk.* lxxviii, 195; ³*Arch. ital. di Otol.* 1920, xxxi, March, No. 1.

OZÆNA.

A. J. Wright, M.B., F.R.C.S.

TREATMENT.—Foy first suggested respiratory re-education as an essential in the treatment of this condition. Duverger,¹ following similar lines, has apparently obtained very successful results. His general conclusions are that ozæna is a local trophic disorder, that the passage of atmospheric air through the nasal passages is the necessary physiological stimulus of the functions of the mucous membrane, and that if nasal breathing can be re-established cure is easy and rapid. The use of any form of lavage is contra-indicated. The crusts are removed by a preliminary softening with an oily spray followed by 'blowing them out'. For the first ten days or so vibratory massage is applied to the nasal mucosa once or twice a day. From the start 'nasal re-education', which is the essential factor, is begun. This consists in a series of very deep inspirations and expirations performed through the nose several times a day, while at night nasal breathing is ensured by covering the mouth with a piece of cloth kept in place by two pieces of elastic round the ears. Iron, arsenic, and iodides are administered as required. The treatment requires a great deal of patience and regularity, but, if persisted in, at the end of two months or less the case will be cured, the crusts having disappeared, and the nasal secretions consisting of a serous and odourless fluid.

REFERENCE.—¹*Med. Press and Circ.* 1920, July 2, 443.

PANCREAS, CLINICAL PATHOLOGY OF.

O. C. Gruner, M.D.

Disturbance of the functions of the pancreas may be detected, according to the recent work of Cammidge, Forsyth, and Howard,¹ by observing the percentage of sugar in the blood, and comparing this with what is called the 'difference value'. This is "percentage of sugar in the blood as measured after hydrolysis of the protein-free blood" (the 'hydrolysis sugar value') minus the "percentage of sugar as obtained by a modified Folin and Wu method".² Normally, the difference value ranges from 0.002 to 0.008 per cent, and is not appreciably influenced by food or the nature of the diet. *Fig. 44* shows results found at hourly intervals after a meal. There is a marked contrast in a case of chronic pancreatitis (*Fig. 45*), where the difference-value curve shows a striking fall after the test-meal.

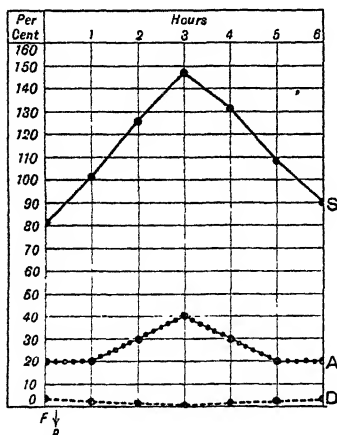


Fig. 44.—Normal blood taken at hourly intervals after a test-breakfast. (S) Sugar per cent $\times 1000$; (D) Difference value per cent $\times 1000$; (A) Amylolytic ferment per cent $\times 10$; (F) Fasting values; (B) Breakfast.

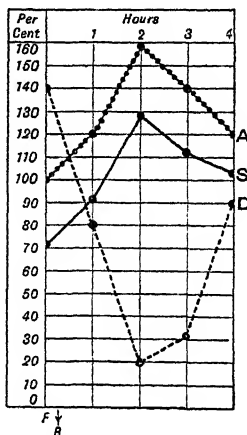


Fig. 45.—Blood from a case of chronic pancreatitis, with a gastric ulcer invading the pancreas, taken at hourly intervals after a test-breakfast. (S) Sugar per cent $\times 1000$; (D) Difference value per cent $\times 1000$; (A) Amylolytic ferment per cent $\times 10$; (F) Fasting values; (B) Breakfast.

The urine in disease of the pancreas contains an excess of dextrin, which can be measured by the iodine coefficient, and less accurately by the difference value of the urine. The amylolytic ferment of the blood and urine in pancreatic disease varies according to the amount of sugar in the blood, and inversely with the difference value of the blood. These observers have conducted an elaborate series of experiments on animals which confirm the clinical observations.

REFERENCES.—¹*Lancet*, 1920, ii, 393; ²*Practitioner*, 1920, Feb., 114.

PANCREAS, DIAGNOSIS OF DISEASE OF. Robert Hutchison, M.D., F.R.C.P.

Garrod¹ reviewed this subject in detail in the Schorstein Lecture for last year. He admits the difficulty of the diagnosis of pancreatic disease, but points out that "the more constantly we bear the pancreas in mind as a possible seat of origin of obscure abdominal troubles, the less likely shall we be to overlook its lesions".

He proceeds: "Many ingenious tests of pancreatic efficiency have been devised, and each test has its adherents and each its critics who question its

utility. But surely we are wont to ask too much from such tests. We cannot look to any test for a penny-in-the-slot diagnosis, especially of such widely diverse lesions as those to which the pancreas is liable. At best we cannot hope to gain more than an item of circumstantial evidence, which, taken in conjunction with other items, may contribute to a diagnosis of probability or even of certainty. Taken alone each test may fail or may actually mislead. In some instances a negative, and in others a positive, response carries little weight, and one needs to get to know a test well before he can estimate the significance of its answers".

He groups the diagnostic indications at our disposal as follows :—

Physical Signs and Symptoms	Defects of External Secretion	Defects of Internal Secretion
Aspect	Steatorrhœa	Glycosuria
Tumour	Fatty stools	Lowered sugar tolerance
Pain	Creatorrhœa	Cambridge's tests
Tenderness	Impaired casein digestion	
Cyanosis		
Vomiting	Duodenal sound	
Constipation	Einhorn's method	
Diarrhœa	Oil breakfast	
Jaundice		
	Sahli's capsules	
Sympathetic signs	Schmidt's test	
Ocular	Kashiwado's nuclear test	
Loewi's test	Sajodin test	
	Diastase test, in urine and fœces	

The adrenalin test of Loewi is one of the most interesting, although not one of the most conclusive, tests of pancreatic efficiency. Two or three drops of a 1-1000 solution of freshly prepared adrenalin are dropped into the conjunctival sac, and the process is repeated in five minutes. If dilatation of the pupil occurs it is, in the lecturer's opinion, strongly suggestive of a pancreatic lesion, although he would never venture a diagnosis upon the result of this test alone.

The indications of abeyance of the external secretion of the pancreas are the most valuable aids to diagnosis we possess, and upon them alone a secure diagnosis can sometimes be based. If there be any single sign which may be regarded as pathognomonic of disease of the pancreas, it is true *steatorrhœa*, i.e., the passage with the fœces of liquid fat which solidifies on cooling. The total fat content of the fœces, made up of fats, fatty acids, and soaps, is a safer guide than the mere gross failure of fat-splitting. Better still is the information supplied by the far more laborious estimation of the proportion of fat taken in the food which is lost in the fœces. When, in addition, there is a conspicuous failure to split fats, the evidence of a lesion of the pancreas is so much the more cogent. In the stools of a healthy man some 75 per cent of the fat is in the split form, whereas some patients with pancreatic disease pass as little as 20 per cent in the forms of fatty acids and soaps. The great diagnostic significance of true *steatorrhœa* arises from the fact that it indicates, not only an excess of fats in the stools, but also an undue proportion of neutral fat.

When, in addition to impaired splitting or utilization of fats, there is obvious failure of protein digestion, the evidence of a pancreatic lesion is well-nigh

conclusive. There are many ways in which such failure may be detected, but the simplest of all is at the same time the most convincing. A patient with severe pancreatic disease will, as a rule, pass in his feces large numbers of muscle fibres derived from the meat which he eats, undigested, and with their striæ clearly visible under the microscope. He may also pass particles of undigested tissue, and Albu recommends calf's thymus as an article of diet the structure of which is easily recognized in the stools. For this phenomenon Ehrmann suggested the name *creatorrhœa*, by which it is generally called; and, although the term invites criticism, it is not easy to invent a better.

Creatorrhœa, although it may accompany profuse diarrhœa from any cause, is hardly inferior to fatty stools in diagnostic value, and it has the advantage that it is not affected by blocking of the bile-duct. In a case with jaundice, in which the indications afforded by the fecal fat are not unequivocal, the discovery of undigested striped muscle-fibres in the stools may help materially to clench an otherwise doubtful diagnosis.

Cases are met with in which the syndrome steatorrhœa-creatorrhœa persists for years in a patient who otherwise enjoys moderately good health, who leads an active life, and exhibits no other gross sign of disease. Some such patients have been found to have the duct blocked with calculi and the structure of the gland destroyed, and yet may never have exhibited glycosuria. In these cases the more elaborate tests will, as a rule, afford additional evidence of disease of the pancreas.

The estimation of diastase in the urine affords one of the best and most useful tests of the integrity of the pancreas, and at the same time one of those most easily and rapidly carried out. This last is an important matter when we are dealing with acute conditions, in which delay of surgical interference may greatly lessen the prospect of its success. The diastase and adrenalin mydriasis tests may be carried out within an hour, whilst the patient and the theatre are being prepared for an operation. But the diastase test shares the uncertainty which pertains to pancreas tests in general. Instead of the normal 10 to 20, or even 30, units, to use the accepted measures of the test, a patient with pancreatic disease may excrete in his urine 50, 100, or even 200 units. On the other hand, another patient similarly affected may show a normal diastase excretion. Mackenzie Wallis emphasizes the fact that the diastase increase is a temporary incident, most conspicuous in the earlier stages of a case. Repeated examinations at intervals may reveal a quicker or slower decline of the diastase output until normal, or even subnormal, figures are reached. Thus it comes about that whereas a conspicuous excess of diastase in the urine is strongly suggestive of disease of the pancreas, a normal excretion in no way excludes even advanced disease of that gland.

Nor must it be forgotten that in many cases of renal disease the power of the kidney to excrete diastase is so seriously impaired that its estimation in the urine is utilized as a test of renal efficiency. This deprives the indications of most of their value, for our purpose, in cases with albuminuria. Again, like Loewi's reaction, the diastase test errs on the side of excessive delicacy. Both tests may give positive answers when, so to speak, the pancreas is merely worried by adjacent disease. Thus, when both these tests yield positive findings, strong evidence—stronger by far than either alone supplies—is afforded that the pancreas is at least concerned in the malady; but, apart from other indications, they are in no way conclusive. Undoubtedly the failure of both tests in no way excludes serious pancreatic mischief.

As regards the diagnostic help furnished by evidence of *failure of the internal secretion* of the pancreas, it may be said that, speaking generally, the absence of glycosuria affords no argument against the presence of disease of the

pancreas, but in not a few cases its presence supplies the crowning evidence in support of a diagnosis based upon other findings. Even in chronic interstitial pancreatitis glycosuria is by no means always present, and Opie attributes this to differences in the incidence of the lesion, which in some cases involves, and in others spares, the islands of Langerhans.

Short of actual glycosuria, the patient's tolerance for glucose may be so far lowered that quantities of that sugar, far smaller than are required to induce glycosuria in a healthy subject, cause glucose to appear in the urine. Thus tests of sugar tolerance are among the diagnostic means at our disposal, but it must be remembered that almost any disturbance of the balance of the internal secretions leads to an alteration, either a raising or a lowering, of glucose tolerance.

Cambridge's reaction, in the lecturer's opinion, is a phenomenon of much interest, the further investigation of which may throw light upon important metabolic events. It is undoubtedly connected with pancreatic derangements, and when observed supplies a contribution to the building up of a diagnosis. But it shares the uncertainty of other pancreatic tests, and may fail us in cases of severe disease of the gland, especially when the disease has reached an advanced stage. So it is natural that many prefer to employ methods which are less time-absorbing, and less at the mercy of small errors of technique. This test has suffered from the fact that too much has been expected from it, perhaps that too much has been claimed for it; and because it has not proved so decisive as was hoped, its utility has not received the credit which it deserves.

The lecturer sums up by stating that it will be evident that practically every sign, symptom, or test may fail us at times, and that in each individual case we need to balance the quantity and quality of the evidence for and against a lesion of the pancreas. In a word, we come back to Wardell's statement of 1871. It is still true that "no symptoms are pathognomonic of pancreatic disease; an assemblage of symptoms points to the probability of its lesion". But we have at our disposal a far greater assemblage of symptoms than Wardell had, and in not a few cases the degree of probability is not to be distinguished from certainty.

That is as much as can be expected when we are dealing with a problem the solution of which rests so largely upon circumstantial, rather than direct, evidence. If we cannot claim for the diagnosis of pancreatic disease the clear-cut, direct answers obtained in some other regions of clinical medicine and surgery, we may none the less regard with complacency what has, so far, been accomplished in this field, by the application of physiological discovery at the bedside, by the co-operation of the laboratory and the ward.

REFERENCE.—¹*Lancet*, 1920, i, 749, and *Brit. Med. Jour.* 1920, i, 450.

PANCREAS, SURGERY OF. *E. Wyllys Andrews, A.M., M.D., F.A.C.S.*

Tumours.—Gilbride¹ reports a case of *cyst of the pancreas*, and discusses the treatment. Total extirpation is a very difficult procedure and is seldom attempted. If it is attempted, the operation should be done in two stages, the first being to empty the cyst and sew it to the anterior abdominal wall. Marsupialization is the best method. It is a safe procedure, and produces nearly 100 per cent cures. The cyst is opened widely and sewn to the anterior abdominal wall, and packed with gauze. Drainage is usually more prolonged than with other types of cysts. It is important to note at the operation if any of the pancreatic ducts empty into the cyst, and if so to sew up their stomata. One should not attempt to inject irritants in the hope of obliterating the cyst wall, because disastrous results have followed such injections.

Cysts of the tail of the pancreas may be drained through the left flank ; but as they are rarely diagnosed except at operation, such an incision would usually have to be secondary to a laparotomy.

Cancer of the pancreas is always inoperable. The diagnosis of primary cancer is seldom made except at operation or necropsy. Koetlitz,² quoting Herringham, says that the diagnosis is made on : (1) A pain situated deep in the epigastric or hepatic region, and progressive emaciation, without signs to establish a cancer of the stomach ; (2) Icterus, and dilatation of the gall-bladder, without a history of biliary colic. Speed³ and Fletcher⁴ have reviewed the literature and reported several more cases. They emphasize the same points. The emaciation is uncommonly rapid and the jaundice very deep. The tumour is not palpable until late in the disease, and then it does not move with respiration. Nausea and vomiting are frequently present. Both agree that the really diagnostic signs of pancreatic disease, glycosuria and fatty stools, are present in only a small percentage of cases. Blood is frequently present in the stools. Calculi were not found in any of the cases. Palliative operations can often be done. Speed says cholecystostomy is usually followed by a rapid decline and death. [The reviewer has also noted the rapid exhaustion following biliary drainage in these cases. Cholecystenterostomy or cholecystgastrostomy are the operations of choice. They bring marked temporary relief, and should be done in all cases where the cachexia has not progressed too far.—E. W. A.]

Pancreatitis.—Archibald⁵ has carried on some very interesting experiments on the etiology of *acute pancreatitis*. He demonstrated that the sphincter of Oddi, in response to certain stimuli, is capable of withstanding a pressure of 50 mm. of mercury. Also that the injection of bile at pressures less than this may set up an intense pancreatitis, exactly similar to the clinical form. The character of the bile is important. Normal bile is relatively innocuous, but bile from which all the mucus has been removed is irritating to the pancreas to a very high degree. These facts show that, theoretically at least, an acute pancreatitis could be caused from a reflex spasm of the sphincter of Oddi from a gastric or duodenal ulcer, and that a stone is not necessary to account for the obstruction of the duct of Wirsung.

Mills⁶ reports three cases of pancreatitis all without stone. Two recovered, one after draining the pancreas itself and the other with bile drainage. He makes the following points in diagnosis : (1) Thin middle-aged women—not fat men as is often stated ; (2) General resemblance to perforated gastric ulcer in the sudden onset of acute abdominal pain after a meal, with abdominal tenderness and rigidity, low temperature, rapid pulse, and shallow breathing. But (a) Pain is across back as well as in epigastrium, and may at first be of the colicky type ; (b) Vomiting is repeated, and may be associated with much eructation of gas ; (c) The rigidity in the early stages is not nearly so marked as in perforated ulcer. Finally, it is worth noting that, though one would expect a trace of jaundice, it was not present in any of the three cases. Its absence, therefore, should not influence the diagnosis of acute pancreatitis.

Nicoll⁷ believes *chronic pancreatitis* is much more common than is usually supposed. He reports seven cases operated on by himself, each presenting typical pictures of ulcer or gall-bladder disease, in which the expected pathology was not discovered. In all of these cases small pieces of the pancreas were excised and examined microscopically, and all showed a chronic pancreatitis. In several, the pancreas felt normal to the examining hand, showing that a gross hardening is not a necessary accompaniment of pancreatic disease. He believes that this should be a routine procedure in all doubtful cases. The pancreas is best exposed through the gastrocolic omentum. The

hole in the pancreas should be closed with the utmost care, as leakage may set up a severe peritonitis with fat necrosis. In chronic pancreatitis a prolonged drainage of bile is indicated, followed by a rigid dietary management.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1920, July 17, 149; ²*Arch. méd. Belges*, 1920, April, 291; ³*Amer. Jour. Med. Sci.* 1920, July, 1; ⁴*Jour. Amer. Med. Assoc.* 1919, Aug. 30, 716; ⁵*Surg. Gynecol. and Obst.* 1919, June, 529; ⁶*Lancet*, 1920, i, 376; ⁷*Brit. Med. Jour.* 1919, ii, 625.

PARALYSIS, GENERAL. (See SYPHILIS OF CENTRAL NERVOUS SYSTEM.)

PARATYPHOID FEVER. (See also INFECTIOUS DISEASES PREVENTION; TYPHOID FEVER.) J. D. Rolleston, M.D.

BACTERIOLOGY.—In 1916 J. Minet¹ was able to isolate in four cases the paratyphoid A bacillus, in two the paratyphoid B bacillus, and in one Gaertner's bacillus, from the sputum of enteric-fever cases. Since then he has frequently found that the different varieties of paratyphoid bacilli may be localized in the respiratory system and be discharged in the sputum. The clinical symptoms in such cases may be simple bronchitis, acute pulmonary congestion, or congestion of the apex simulating tuberculosis. These observations show a new mode of contagion for paratyphoid fever, viz., contagion by the sputum, and the existence of a pulmonary carrier of paratyphoid.

SYMPTOMS.—T. Klein and R. G. Torrey² report four cases of paratyphoid fever with *pulmonary complications*, the causal organism in three cases being *B. paratyphosus B* and in one *B. paratyphosus A*, which was cultivated from the sputum. In one case there was frank lobar pneumonia, and in the other three bronchopneumonia. The writers conclude that there is a definite pulmonary form of paratyphoid fever which may be mistaken for any of the acute infections, especially as the pulmonary symptoms often precede any intestinal manifestations.

C. Vallardi³ states that paratyphoid fever A was very prevalent in the Italian Expeditionary Force during the triennium 1916-18. He thinks that the previous diffusion of the disease in Eastern Europe was increased by the presence of French and British colonial troops in whom the disease was prevalent. The mortality from paratyphoid A in all the Allied forces was much lower than that of typhoid or paratyphoid B, being only 0.84 to 3.03 per cent. Numerous paratyphoid A carriers were found in soldiers with intestinal syndromes due to various causes, including acute or chronic bacillary or amœbic dysentery. On the other hand, S. Silbiger,⁴ in his description of paratyphoid A fever in Wollhynia, states that though mild forms predominated, the complications and sequelæ of severe attacks indicated that the disease was no less serious than typhoid or paratyphoid B. He regards the following clinical features as in favour of a diagnosis of paratyphoid A; an intermittent and remittent temperature, and wide distribution of the rose spots, which are papular rather than maculo-papular in character.

Ferrannini⁵ reports a unique case of paratyphoid A in a soldier, complicated by mitral incompetence, myocardial degeneration, and diffuse chronic nephritis.

Federschmidt⁶ describes a local outbreak at Nuremberg of 65 cases of severe gastro-enteritis following the consumption of sausages composed of horse-flesh, examination of which showed the presence of paratyphoid B bacilli. The onset of the symptoms occurred a few hours after taking the food, and consisted of vomiting, abdominal pain, profuse diarrhoea, and high fever. Recovery took place in three to four days.

According to Hage,⁷ a few cases of paratyphoid *cholecystitis* with calculus formation and without any co-existent intestinal disease have been recorded. Lorey, in one case of the kind, found paratyphoid B bacilli, and Blumenthal

and Springer each reported a case due to the paratyphoid A bacillus. Hage himself relates a case of cholecystitis due to paratyphoid B infection in a man, age 41, who had no intestinal symptoms. The presence of calculi in the gall-bladder could not be determined, as operation was refused and no stones were found in the stools. Hage draws attention to the necessity of making a serological and bacteriological examination in cases of cholecystitis even when there are no obvious signs of intestinal disease.

Serre and Brette⁸ record two cases of unilateral *orchitis and epididymitis* following paratyphoid B, which in one patient occurred at the commencement of convalescence, and in the other twenty-five days after the temperature had become normal. Recovery took place without atrophy of the testicle.

According to Netter, Mozer, and Salanier,⁹ who report four cases, the paratyphoid B bacillus may occur in pure culture in *suppurative arthritis*. This form of arthritis is most frequent in infants, in whom it may attack one or several joints. As a rule it accompanies the digestive and respiratory symptoms of the infection. In some cases the joint manifestations are milder and do not end in suppuration. The condition is then liable to be mistaken for acute rheumatism.

Paratyphoid C.—L. Hirschfeld,¹⁰ director of the Central Laboratory of the Serbian army, has given the name of paratyphoid C bacillus to an organism resembling morphologically and culturally the paratyphoid B bacillus, but not agglutinable by the corresponding specific serum. The clinical picture of the infection in his cases was that of paratyphoid fever. Cases of paratyphoid C have also been described by F. P. Mackie and G. J. Bowen¹¹ in Mesopotamia, J. A. Kennedy¹² in India, and R. P. Garrow¹³ in East Africa. The infection described by W. MacAdam (*see MEDICAL ANNUAL*, 1920, p. 266) also belongs to this group. In several of Mackie and Bowen's cases, as in MacAdam's, there were well-marked pulmonary symptoms, so that a diagnosis of pneumonia was made. On the other hand, in the sporadic case reported by Garrow, the patient showed the cardinal signs of a moderately severe attack of enteric fever, and there were no lung signs beyond a few moist râles at the bases.

L. S. Dudgeon and A. L. Urquhart¹⁴ describe two fatal cases of paratyphoid C infection which occurred in the Balkans. At the autopsy which was performed in one case, the spleen was found to be much enlarged, very soft, and congested. There was no intestinal ulceration, but marked patchy congestion of the intestinal wall. They also report a case in which *B. paratyphosus C* was grown in blood-culture from a case of enterica admitted to St. Thomas's Hospital, London.

REFERENCES.—¹*Med. Science*, 1920, ii, 3; ²*Amer. Jour. Med. Sci.* 1920, i, 548; ³*Riforma Med.* 1919, 1046; ⁴*Med. Science*, 1920, ii, 7; ⁵*Ibid.*; ⁶*Munch. med. Woch.* 1920, 814; ⁷*Deut. med. Woch.* 1919, 971; ⁸*Lyon méd.* 1919, 493; ⁹*Bull. Soc. de Péd.* 1919, 100; ¹⁰*Lancet*, 1919, i, 296; ¹¹*Jour. R.A.M.C.* 1919, ii, 154; ¹²*Ibid.* 190; ¹³*Lancet*, 1920, i, 1221; ¹⁴*Ibid.* 1920, ii, 15.

O. C. Gruner, M.D.

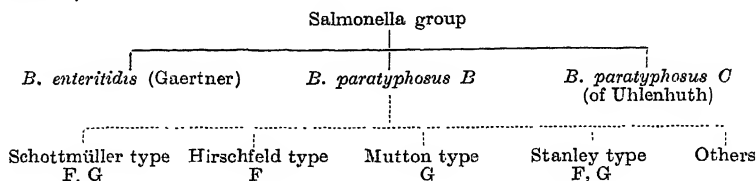
Gardner¹ deals with the standardization of agglutinable cultures, and shows that many strains of *B. paratyphosus A* are serologically related, indicating that there is uniformity to that extent.

Strains of members of the colon-typhoid group, especially in the dysentery series, have been thoroughly studied by Winslow, Kligler, and Rotberg,² using fermentation tests to correlate these reactions with the serological reactions. It is important to separate out the races concerned in the given clinical case.

Goeckel³ advises the examination of the *urine* for typhoid and paratyphoid organisms, using agglutination tests. The bacilli found in the urine are submitted directly to the agglutinating serum. Positive results can be obtained

quite early in the disease, before the blood gives any reaction, and is not interfered with by a previous antityphoid inoculation.

A careful study of the organisms of the paratyphoid group is reported on by Schutze,⁴ who has investigated various strains, both by agglutination and by absorption methods. Forty-six 'Aertrycke' strains (food-poisoning) were investigated, and their relationships are shown by the following table (Schutze):—



F = known to occasion continued fever in man; G = known to occasion acute gastro-enteritis.

Continued lines = differentiated by agglutination; dotted lines = differentiated by absorption test.

This table shows that various species regarded as different may yet rightly be spoken of as forms of paratyphoid B. They may each produce fevers simulating enteric.

REFERENCES.—¹*Lancet*, ii, 494; ²*Jour. of Bacteriol.* 1919, iv, 428; ³*Jour. of Lab. and Clin. Med.* 1920, Jan., 255; ⁴*Lancet*, 1920, i, 93.

PAROTITIS, SUPPURATIVE.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Fisher¹ discusses the subject of suppurative parotitis. In one case, on the second day after a pelvic operation, stiffness of the jaw with swelling of the right parotid gland developed; on the sixth day a free incision disclosed the beginning of suppurative parotitis; a few days later there was a profuse discharge of pus. During the progress of suppuration the patient's condition was critical. In such cases early incision is to be recommended; actual suppuration should not be awaited, as gangrene may rapidly ensue. Tuffier thought that parotitis did not especially follow abdominal operations, but was associated with chloroform anaesthesia. Death has resulted from phlebitis and thrombosis, and from secondary hæmorrhage. It is stated that 30 per cent of the cases end fatally. In the cases where the treatment is by incision, the surgeon must not wait for fluctuation, as the pus infiltrates into the glandular tissue, creating multiple pockets. Often multiple incisions are necessary. The route of infection may be oral, and not necessarily through the lymph or blood. It is possible that some cases result from trauma, such as direct pressure on the glands, or forcible pressure on the jaw by the anaesthetist during operation. Fisher, after quoting the opinions of various authorities, concludes his paper as follows:—

1. That septic parotitis is of hæmatogenous origin.
2. That cachexia and malnutrition, by lowering resistance, are predisposing factors.
3. That the susceptibility of the gland is favoured by stasis.
4. That the secretion of the gland is under the influence of nerve stimuli, and that the incidence of post-operative parotid involvement is neurologically dependent upon surgical shock or inhibition of the secretory and trophic fibres from higher psychic centres.
5. That the gland must be susceptible to pyogenic micro-organisms, and that, when it is affected, bacteraemia exists in all cases.

6. That early incision and drainage are indicated.

7. That the surgical technique advised by Lilienthal and Blair should be employed.

REFERENCE.—¹*Ann. of Surg.* 1919, Dec., 713.

PELLAGRA. (See DEFICIENCY DISEASES.)

PEMPHIGUS VEGETANS.

E. Graham Little, M.D., F.R.C.P.

Barker and Carter¹ contribute a very important paper on this subject, and describe a case of unusual chronicity, inasmuch as the disease so commonly has a rapidly fatal termination. The patient was a native-born American woman of 20 who had suffered from early childhood from colitis. In 1911 she seems to have had a rash which might have been pemphigus, but definite lesions in the mouth were first noted in 1915, and later in the same year on the vulva. The diagnosis of syphilis was made, and she was given salvarsan injections, with some improvement, merely temporary. In 1917 she began to have lesions in the throat. She was admitted to the Johns Hopkins Hospital in that year, when there was extensive superficial ulceration of the lips, palate, and pharynx, and excoriation of vulva, without glandular enlargements. The patient was emaciated and extremely ill, but the temperature (except for a short period when it reached 102.6°) was practically normal. There was very persistent diarrhoea, with occasional vomiting. Bacteriological examination of the stools showed only the colon bacillus. Remissions and exacerbations occurred during the eight and a half months she remained in hospital, and she was discharged without material improvement. The authors regard the symptoms as pointing strongly to a chronic bacterial or parasitic invasion, with elective affinities for certain parts of the skin and mucosæ, and draw analogies between this disease and syphilis and yaws.

TREATMENT.—During the patient's long stay in the hospital many and various local and general measures were tried. None had any directly curative effect upon the lesions of the skin and mucous membranes.

REFERENCE.—¹*Johns Hop. Hosp. Bull.* 1919, Oct., 302.

PERICARDITIS.

Carey Coombs, M.D., F.R.C.P.

Williamson's¹ researches into the distribution within the pericardial sac of *effusions*, and the physical signs arising therefrom, are of interest chiefly by reason of a case in which it was possible to substitute for the pathological effusion an artificial one, within a few minutes of death, so that the mechanical effects could be studied at leisure. Points of clinical interest are: (1) It is not effusion into the pericardium that produces Rotch's sign (dullness in the cardiohepatic angle); (2) Retrosternal dullness, due to accumulation of fluid round the great vessels, is an important sign of effusion; (3) Pushing down of the left lobe of the liver is an early and conspicuous feature of pericardial effusion; (4) Friction is to be heard even in the presence of considerable effusions; (5) The sac is best punctured either just outside the apex or in the chondroxiophoid angle.

Lyster's² paper on pericardial *adhesions*, based on autopsy cases, goes far to show that during life these adhesions do not directly cause physical signs. Much of the writing to the contrary is erroneous, because it fails to realize that physical signs accompanying pericardial adhesions are due chiefly, if not entirely, to the myocardial and endocardial changes which almost always coincide with pericarditis.

REFERENCES.—¹*Arch. of Internal Med.* 1920, Feb., 206; ²*Amer. Jour. Med. Sci.* 1920, ii, 891.

PHARYNGOSPASM.*Frederick Langmead, M.D., F.R.C.P.*

Weill¹ calls attention to spasm of the pharynx, occurring in children, and liable to be provoked by trivial lesions. It causes no pain, but the child refuses food and is supposed to suffer from lack of appetite. It may persist intermittently for weeks or months, and the child seems to have forgotten all about eating, perhaps continuing to chew food put into his mouth, without attempting to swallow it. The children studied were between 19 months and 9 years old. Weill passes Bouchard rubber Sounds for progressive dilatation; sometimes a cure is effected at one sitting, but two or three sittings may be required. Cold-water Compresses to the throat for thirty to forty minutes, followed by massage, may relieve the spasm, or a finger pressed on the trachea will start swallowing in children who shrink from attempting it; but neither of these measures proved as valuable as the sound. With a neuropathic tendency, swallowing may sometimes occur naturally if a stranger administer the food.

REFERENCE.—¹*Paris méd.* 1919, Dec. 6, No. 49 (abstr. in *Jour. Amer. Med. Assoc.* 1920, Jan. 24, 286).

PHARYNX, CANCER OF.*A. J. Wright, M.B., F.R.C.S.*

Carcinoma of the Post-cricoid Region.—Logan Turner¹ has given a clinical analysis based on 98 cases under his observation. In all except one (a case of medullary carcinoma) the tumour was a squamous-celled carcinoma. Carcinoma in this situation occurs most frequently in women, and at a comparatively early age. Thus, of these 98 cases, 85 were in women. Considering figures of the combined incidence of carcinoma of the tongue, fauces, pharynx, œsophagus, stomach, and larynx, only 33 per cent occur in women, while if figures be taken for the oral pharynx alone, 42 per cent are in women. In other words, the pharyngeal mucosa in women appears to be more liable than in men to the development of squamous-celled carcinoma, especially in the lowest part, whereas in the rest of the upper end of the alimentary canal the mucous membrane is more liable to this form of tumour growth in men. The average age-incidence in women was 45 years and in men 57.

SYMPTOMS.—Obstruction in swallowing is the most frequent. This may occur suddenly with the sensation of a foreign body lodged in the throat, or may be present over a very long period—in either case possibly suggesting a functional origin. Pain is frequent, as is excess of mucous secretion, which is sometimes blood-stained. Hoarseness, or some alteration in the voice, is often present or develops later. Palpation is an important part of the physical examination, a local thickening, glandular enlargement, or enlargement of the thyroid gland by invasion with the growth being not uncommon.

Laryngoscopy shows changes from the normal in a large proportion of cases (84 per cent in this series), these changes consisting of impairment in the mobility of the vocal cords, or alterations in the mucosa covering the arytenoids or on the post-pharyngeal wall behind the larynx. An accumulation of mucus behind the arytenoids is always suggestive. Suspension laryngoscopy and œsophagoscopy give valuable information, and enable a portion of growth to be removed for histological examination. X rays are chiefly helpful as an aid in estimating the extent of growth and length of the stricture when operation is under consideration.

TREATMENT.—Removal depends on early diagnosis. Of these 98 cases, only 9 were subjected to excision, and in one of these it was found to be impossible to remove the disease completely. In the 8 remaining cases, the duration of life after operation was three months, four months, six months, one year, one year and two months, and one year and six months; two cases are still alive, one two years and the other nine years after operation.

The choice between œsophagostomy and gastrostomy depends on the inclination of the individual surgeon.

The operative treatment of malignant disease of the pharynx has not given satisfactory results in the past. Trotter,² as a result of a considerable experience, has elaborated the technique of **Lateral Pharyngotomy**, which he considers to be the operation of choice in most cases. The operation should be considered as one needing two separate steps, the exposure and removal of

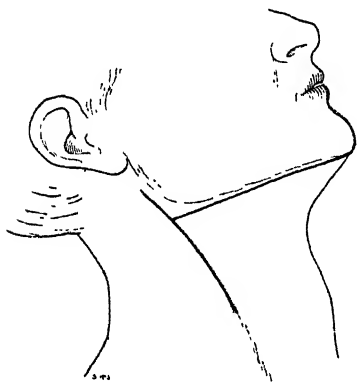


Fig. 46.—Incisions.

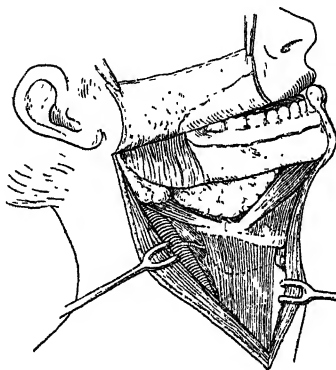


Fig. 47.—Flaps reflected.

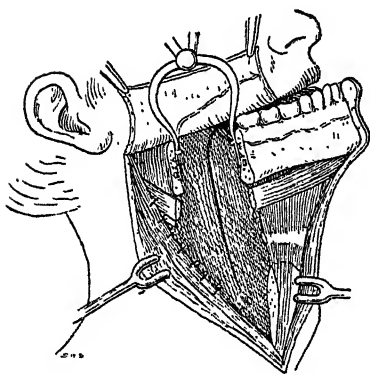


Fig. 48.—Lateral wall of pharynx fully exposed.

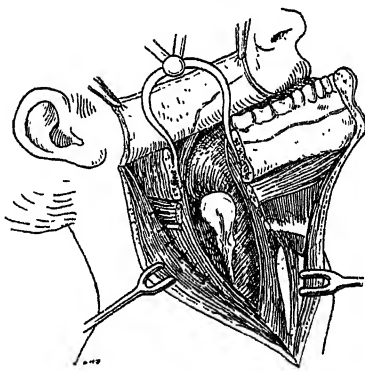


Fig. 49.—Incision in pharynx.

Figs. 46-49.—TROTTER'S LATERAL PHARYNGOTOMY.

(Reproduced from 'The Journal of Laryngology, Rhinology, and Otology'.)

the growth respectively. The advantage of lateral pharyngotomy is that it is not limited above or below, and can therefore be adapted to all cases.

Superior lateral pharyngotomy consists essentially in dividing the mandible in front of the masseter, and then incising the superior constrictor in front of the tonsil. This gives access to the tonsils, faucial pillars, and base of the tongue. Inferior lateral pharyngotomy consists in removing the great cornu of the hyoid and ala of the thyroid, and incising the aponeurosis of the pharynx.

It gives access to the aryepiglottic fold, arytenoid cartilage, pyriform sinus, and postericoid region.

To deal with the region of the epiglottis and with large tumours of the upper laryngeal opening, fuller access is necessary, and can be obtained by the operation of combined lateral pharyngotomy here described. The steps of this operation are as follows (*Figs. 46-49*):—

1. Preliminary tracheotomy should include division of the thyroid isthmus, if necessary, and removal of a disc from the anterior tracheal wall.

2. Incisions along the anterior edge of sternomastoid from the lobule of ear to cricoid, and vertically through the mid-line of the lower lip, and then along below the lower margin of the jaw to join the first incision.

3. The sternomastoid is defined and retracted, the submaxillary and anterior triangles are cleared of glands, and the muscles, vessels, and nerves passing forward to the pharynx divided. The cut ends of the hypoglossal nerve should be each secured with a stitch to facilitate suture later.

4. The pharynx is displaced forwards, and the sternomastoid folded over the carotid region and stitched to the prevertebral muscles, thus limiting spreading infection and secondary hæmorrhage.

5. The great cornu of the hyoid and the thyroid ala having been freed from muscles, which are turned backwards, are then separated from the underlying pharynx and removed. The pharyngeal wall is thus made bare.

6. The flap is turned back off the mandible, and the jaw is drilled for wiring, and then sawn just in front of the masseter; the fragments are separated with an automatic retractor, and the lateral pharyngeal wall is incised throughout its length, thus exposing the growth.

7. The tumour should now be excised with an adequate margin, regardless of what structures have to be removed with it. This may later entail plastic operations, with skin-flaps to make good defects in the pharynx.

It is a necessary preliminary to operation that the patient be made edentulous, and that the gums should be firmly healed. This obviates necrosis of the mandible.

REFERENCES.—¹*Jour. of Laryngol. Rhinol. and. Otol.* 1920, Feb., 34; ²*Ibid.* Oct., 289.

PILES. (*See HÆMORRHOIDS.*)

PLEURAL EFFUSION, CLINICAL PATHOLOGY OF. O. C. Gruner, M.D.

Further investigations into the cytological formula of pleural fluids have been made in the Brompton Hospital. Page¹ finds that an increase of the lymphocytes may be met with in effusions associated with neoplasms, and also in renal cases, besides the classical tuberculous effusions. When eosinophils are present in conspicuous numbers, the effusion is probably not tuberculous. Neutrophils often predominate in chronic pleural effusion complicating tuberculosis. If there is no secondary infection of the fluid, neutrophilia of the fluid suggests the possibility of hydropneumothorax being present.

The complement-fixation test may be successful with the serum of a primary pleural effusion when it fails with the blood-serum. The precipitin reaction is not always positive. The question is raised whether these and other findings do not indicate the presence of some substance in the fluid which is useful in combating the disease.

Cobet and Ganter,² arguing that ordinary physical examination does not give a reliable idea of the size of an effusion, introduce known amounts of (1) saline solution, (2) dyes or sodium iodide solution, into the pleural cavity. After the material has become admixed with the fluid, a portion is withdrawn,

and the volume of the original fluid can be ascertained by calculation. When (1) is used, the analysis is made by means of a refractometer; in the other case by means of a colorimeter, or a chemical analysis is conducted.

For X-ray diagnosis see p. 29.

REFERENCES.—¹*Lancet*, 1920, i, 585; ²*Deut. Arch. f. klin. Med.* 1920, April, cxxii, 35.

PLEURISY.

Arthur Latham, M.D., F.R.C.P.

Induced Pneumothorax in Treatment of Serofibrinous Pleurisy.—Weil¹ has now a record of 50 cases of serofibrinous pleurisy in which he injected air, after evacuating the effusion, until the pressure was the same as before. This ensured healing without sequelæ in 82 per cent of the cases, and the failures were in cases with pre-existing adhesions or tuberculous lesions in adjoining organs. A complete success, therefore, can be realized only when the diaphragm is free, but in one case the diaphragm finally regained its full play after a year of treatment, with ten interventions. In 34 per cent healing was complete in two or three months; in a few in less than a month. In a parallel series of 86 cases simply punctured, without attempting to induce the *pneumothorax*, only 16 per cent healed without disturbing sequelæ.

Treatment of the After-effects of Pleurisy, etc.—Zadek² gives case-histories which show the remarkable benefit that can be derived from the special **Breathing Exercises** he describes in warding off and curing adhesions and many chronic pathological conditions entailing retraction and shrivelling of lungs and pleura. Inspiration is slow and deep, "as if to burst one's belt"; expiration is aided with the hands applied to the chest wall below the breast, the thumb turned toward the back, the little finger on the costal arch at the nipple line, the fingers in the interspaces. There should be no active pressure from the hands. Inspiration should take about four seconds, and expiration three seconds, and the exercise should be repeated from three to six times a day. Three inspirations at first are enough, but later from three to eight minutes or longer are given to exercise. The exercise should always stop short of inducing palpitation, etc.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, Aug. 23, 646; ²*Ibid.* 1920, April 17, 1137.

PNEUMONIA.

Arthur Latham, M.D., F.R.C.P.

Blake and Cecil,¹ working in the laboratories of the United States Army Medical School, have succeeded in producing a disease corresponding in all respects apparently with lobar pneumonia in man, by introducing the pneumococcus into the trachea of monkeys. The needle of a hypodermic syringe was inserted between the rings of the trachea just below the larynx, and a small dose (1 c.c.) of a dilution of a broth culture of the pneumococcus introduced in this way into the trachea. The great majority of the monkeys thus injected developed lobar pneumonia. Attempts to produce pneumonia by instillation of virulent pneumococci into the nose and throat of monkeys were unsuccessful. Attempts to produce the disease by subcutaneous or intravenous inoculation also failed. In the majority of cases the pneumococcus was recovered from the blood within six to twenty-four hours of its injection into the trachea, and frequently before elevation of temperature took place or there was clinical evidence of pneumonia.

Active Immunity Established by Experimental Pneumonia.—According to Cecil and Blake,² experimental pneumococcus Type I pneumonia in monkeys confers on them an immunity which protects them against subsequent infection with the homologous type of pneumococcus. The duration of this immunity has not been determined. A certain amount of cross immunity

against the other fixed types of pneumococcus pneumonia may or may not be present following experimental pneumococcus Type I pneumonia. The degree of cross immunity is difficult to measure, and probably varies widely with the individual monkey. Experimental pneumococcus Type IV pneumonia in monkeys confers slight if any protection against subsequent infection with the same, or with an homologous strain of pneumococcus Type IV. There is no evidence in monkeys of cross immunity against pneumococcus Type IV pneumonia following pneumococcus Type I pneumonia; and, conversely, pneumococcus Type IV pneumonia confers no cross immunity against pneumococcus Type I pneumonia.

Type I Pneumonia treated by Homologous Serum.—Charles F. Tenney and William T. Rivenburgh³ treated 61 coloured patients suffering from Type I pneumonia. On admission each patient received $\frac{1}{2}$ c.c. of normal horse serum subcutaneously for desensitizing purposes. Within four to six hours after the patient's admission the **Homologous Serum** was given; the least amount given to any one patient was 30 c.c., the largest amount 900 c.c.; the total amount used was 20,955 c.c., the average amount given per patient being 344 c.c. Serum sickness came on in practically all the cases in four to sixteen days after the last injection. A hypodermic injection of $\frac{1}{2}$ to 1 c.c. of epinephrin in a 1-100 solution relieved its symptoms. The serum was given at eight-hour intervals, day and night, till the rectal temperature registered 100° or lower.

Of the 61 patients having the serum, 30 recovered by crisis, 22 by lysis, and 9 died. To the 30 who recovered by crisis, a total amount of 8665 c.c. was administered, or an average dose of 288 c.c. Those ending in lysis received a total amount of 9010 c.c., or an average dose per individual of 410 c.c. To those who died, 3200 c.c. were given, or an average dose per individual of 356 c.c.

In addition to the serum treatment, general treatment was carried out. Each patient had 1000 cubic feet of air space. The windows were open day and night, and on sunny days the patients were moved to the porch. Rather large doses of **Digitalis** and **Whisky** were used during the critical stage, and **Codeine** was administered when a sedative was necessary.

The Rockefeller Institute states that the expected rate of mortality in this type of pneumonia where the serum is not used is 25 per cent. Their mortality-rate with the use of the serum, in a series of 101 cases, was 7.5 per cent, using an average amount per individual of 250 c.c. The authors' mortality-rate was 14.7 per cent. This higher death-rate might be explained by a lower resistance to pneumonia in the coloured race, the unfavourable season of the year, and the forced moving of troops from place to place.

Sodium Citrate in Treatment.—Weaver⁴ speaks highly of the use of **Sodium Citrate** in large doses in pneumonia, and says that it leads to a marked reduction of the morbidity as well as the mortality of the disease. He gives the drug with plenty of water, in doses of 15 to 20 gr. an hour, or 40 gr. every two hours, night and day, till the second or third day after the crisis. Occasionally this dose has a purgative effect, which is easily checked by opium.

Arsphenamine in Pneumonia with Delayed Resolution in Syphilitic Soldiers.—Head and Seabloom⁵ used **Arsphenamine** in three cases of pneumonia where syphilis appeared to have led to delayed resolution, with the result of promptly clearing up the condition. They call attention to the fact that syphilis may prolong or delay the reparative process in the lungs of persons who have had pneumonia, and that syphilitic persons with pneumonia are liable to exhibit signs of delayed resolution for weeks or months. The healing process in these cases does not progress as in the normal individual, and the usual

methods of treatment are of no value, while in the cases recorded specific treatment was effective.

Aspidosperma advised for trial in chronic cases (p. 5); and **Glucose** injections in influenzal pneumonia (p. 11). For **X rays** in diagnosis see p. 29.

REFERENCES.—¹*Brit. Med. Jour.* 1920, i, 675; ²*Jour. Amer. Med. Assoc.* 1920, July 24, 271; ³*Arch. of Internal Med.* 1919, Nov., 545; ⁴*N. Y. Med. Jour.* 1919, Nov. 1, 706; ⁵*Jour. Amer. Med. Assoc.* 1919, Nov. 1, 1344.

POLIO-ENCEPHALOMYELITIS, ACUTE (X DISEASE).

J. Ramsay Hunt, M.D.

A complete clinical description, with the character of the histological lesions and the transmission to lower animals, of this interesting and obscure infection of the nervous system, is given by Cleland, Campbell, and Bradley¹ in the Report of the Director-General of Public Health, New South Wales, for the year 1917. Their conclusions may be summarized as follows:—

A severe disease, with cerebral symptoms, and with a mortality of about 70 per cent, appeared in certain western districts of New South Wales in the late summer and autumn of 1917, and again a little earlier in the year 1918. Outbreaks of a similar disease occurred in the Goulburn Valley in Victoria, in Brisbane and Western Queensland, and in the Townsville district. Cases were entirely absent or remarkably few in the intervening and subsequent winter and spring months.

The disease has been shown by histological examinations to be a polio-encephalomyelitis. It is characterized especially by cellular sheaths, often marked, round the veins in various parts of the central nervous system. These occur not only in the grey matter, but also, to a less extent, in the white matter and in the pia mater. Small cellular collections or accumulations also occur in the grey matter.

The clinical symptoms are for the most part such as would be expected to result from the histological lesions detected in fatal cases. Convulsions, rigidity, coma, and fever are the commonest features, sometimes accompanied by paralysis of a limb or limbs. Most cases could be recognized as belonging to a definite clinical entity, resembling in signs and symptoms cerebrospinal meningitis, with which the disease has been frequently confused. The presence of clear cerebrospinal fluid, in contradistinction to the purulent fluid usually found in cerebrospinal meningitis, is of considerable assistance in diagnosing this disease. After recovery, occasional instances of mental disorder, usually temporary, and of paralysis, have been met with. Very rarely has the course of a case been such as to suggest to the medical man in attendance the diagnosis of acute poliomyelitis (infantile paralysis).

There has been no concomitant epidemic of ordinary acute poliomyelitis (infantile paralysis) in New South Wales during these two outbreaks, and no increase in cases of ordinary infantile paralysis in the affected districts. In some of the affected districts no cases of infantile paralysis at all have been recorded. There is no evidence of the human disease occurring in animals, or of animals acting as a reservoir of the virus, or of the disease being conveyed by an intermediate host from human being to human being. The evidence suggests that human carriers may be the transmitting agents, but it is impossible to trace the connection.

The disease has been conveyed by intracerebral inoculation to monkeys (*Macacus rhesus*), sheep, a calf, and a horse.

The disease in the monkey runs a characteristic course, in which intense inco-ordination, with violent and irregular muscular movements, usually predominates greatly over any paresis and paralysis. There is no loss of

consciousness in monkeys. Similarly in sheep, the calf, and the horse, the occurrence of convulsions is common, whilst a marked flaccid paralysis has not been noted. Loss of consciousness occurred in the horse.

The disease has not been conveyed to monkeys or sheep by intraperitoneal or intrasciatic inoculations, by swabbing the nose with the virus, or by Pasteur-Chamberland F. or Berkefeld filtrates of the virus. The virus has not been proved to be present in the cerebrospinal fluid, the nasopharynx of cases or contacts, or the faeces.

All sheep inoculated intracerebrally with the virus do not develop the disease. In a series of these animals all inoculated at the same time, in the same way, and with the same material, some may develop the disease, some may show slight symptoms presumably of the disease, and some may be quite unaffected (immune). Such immune sheep, re-inoculated with further virus-containing material, have still failed to develop the disease. The serum of a sheep which had exhibited symptoms, and was finally shown to have histological lesions of the disease, apparently neutralized the virus *in vitro* before its intracerebral inoculation into a monkey.

This experience in sheep suggests that in human beings the same actual or relative immunity may exist in certain individuals, even in the face of the actual introduction of the virus into the central nervous system. Here may perhaps be found an explanation of the apparently sporadic way in which cases of the disease develop. If the virus during an epidemic be considered as being widely distributed, the relative paucity of cases would be explained by the majority of individuals being actually immune to the virus even after it had gained entrance to the nervous system.

This disease is a distinct clinical entity. The virus responsible for it is evidently closely related to that causing ordinary acute poliomyelitis, but is either specifically distinct, or a more recent variant apparently breeding true.

REFERENCE.—*Report of the Director-General of Public Health, New South Wales, for the year ended 31st December, 1917, Part V.*

POLYNEURITIC SYNDROME IN ACUTE INFECTIOUS ENTERITIS. (See ENTERITIS.)

PREGNANCY, DISORDERS OF.

W. E. Fothergill, M.D.

Eclampsia.—C. A. F. Hingston¹ reports on 64 cases of eclampsia treated mainly by venesection at the Government Maternity Hospital, Madras. He finds the results of **Venesection** in eclampsia with raised blood-pressure superior to those secured by other methods. It was used in 51 out of 64 cases, the remaining 13 having the blood-pressure low or immediately reducible by delivery. The first thing to do is to reduce the blood-pressure of the patient to 120 mm. by bleeding and to keep it down until the child is delivered. This avoids congestion of the lungs and high temperatures. If the temperature rises above 102°, it may be reduced by iced enemata. No food is given by the mouth. The lower bowel is washed out. If the patient can swallow and has been constipated, **Magnesium Sulphate**, 4 drachms to the ounce of water, is given. A quarter of a grain of **Morphia** is injected after the patient has had one undoubted fit. If the stomach is full, it should be washed out.

It is generally necessary to take twenty and occasionally thirty ounces of blood at the first bleeding. When a second bleeding is necessary, the blood-pressure is reduced to 100 mm., and has been reduced to 85 mm. without ill effect. Forceps delivery is advisable after the os is dilated, but *accouchement forcé* is not approved. Out of the 51 cases, no less than 45 recovered.

REFERENCE.—¹*Ind. Med. Gaz.* 1920, Jan., 18.

PROSTATE, SURGERY OF.*J. W. Thomson Walker, M.B., F.R.C.S.*

Blum¹ discusses the *indications and contra-indications for prostatectomy*. The indications arise from the knowledge that all other methods of treatment are more dangerous, that the disease is a progressive one, and that malignant changes may take place. Prostatectomy is indicated in all cases in which there is complete or incomplete urinary obstruction, or if the subjective symptoms endanger the general condition of the patient. The contra-indications are general debility, especially the most severe form of urinary cachexia and severe persistent disturbance of the heart function, uræmia and diabetic coma, cerebral and spinal paralysis, severe disease of the internal organs such as tubercle or carcinoma, severe bilateral nephritis, and periprostatic and perivesical suppuration. The operation is indicated in complications of prostatic hypertrophy, such as large stone, tumours and diverticula, in slight cystitis, and in chronic pyelonephritis of moderate grade. In severe infections of the bladder with fever and urinary sepsis, in temporary renal inefficiency, the operation should be performed in two stages. The prostatectomy of urgency in serious hæmorrhage and in acute retention of urine should be avoided whenever possible, as the results are worse than the operation after careful preparation with catheter drainage. Prostatectomy as an early operation in the first stage of hypertrophy where there is not yet urinary retention is, according to Blum, not justified. The perineal operation is the operation of choice, he says, on account of the danger to the sexual function, the possibility of fistula and changes in the urethra, and recurrence with the suprapubic method, and is therefore to be preferred to the latter.

Meltzer² considers that careful preliminary examination of cases of enlarged prostate is the chief factor in safe treatment. The following are the important points in examination :—

1. The appearance of the tongue, the red, glazed, dry tongue indicating renal inefficiency.
2. The blood chemistry, with special reference to the retention of creatinine, urea nitrogen, and non-protein nitrogen.

Creatinine.—Normal, 0.1 to 0.5 mgrm. per 100 c.c.

Abnormal, 1.5 to 4 mgrms. per 100 c.c.

Urea nitrogen.—Normal, 15.0 to 25.0 mgrms. per 100 c.c.

Abnormal, 40.0 to 100 mgrms. per 100 c.c.

Non-protein nitrogen.—Normal, 30.0 to 45.0 mgrms. per 100 c.c.

Abnormal, 70.0 to 200.0 mgrms. per 100 c.c.

When examination of the blood shows high figures, nothing more than urinary drainage and expectant treatment should be done.

3. The kidney function by the phenolphthalein test. A normal renal function will show 30 to 60 per cent for the first hour and 15 to 30 per cent for the second hour. A poor renal function will show 5 to 20 per cent for the first hour and 0 to 10 per cent for the second hour.

4. The general condition of the patient.

5. Examination by *x* rays, cystoscopy, urine analysis, measurement of residual urine, and 24-hour estimation of fluid intake and output.

Cunningham³ holds that the most commonly associated dangers in prostatic surgery are respiratory and cardiorenal. Pre-operative study and preparation are the first essentials of success in treating these cases. Pre-operative study eliminates those patients whose general condition is such that they cannot stand operation, and who must therefore lead a catheter life. Those with advanced carcinoma of the prostate, and those with the symptoms of prostatic congestion dependent upon the retention of prostatic secretions and secondary congestion, are best treated by non-operative methods.

Patients fit for operation are divided into those suitable for non-radical and those for radical operation. The first class includes those whose general condition is below the standard required for a radical operation and who cannot lead a catheter life. For those the Bottini or the French operation is recommended. Radical operations are best performed under gas-oxygen anaesthesia, and no one operation is suitable for all cases. Suprapubic prostatectomy has a relatively high mortality and a better functional result than perineal. The author recommends that only those cases which are the best risks should be submitted to suprapubic prostatectomy. Those not coming up to the necessary standard are operated on by the perineal route.

In perineal operations the dissecting operation is attended with a slightly higher mortality than the simple intra-urethral enucleation of the gland, but a better functional result is obtained. The median perineal intra-urethral enucleation of the gland is the simplest method of prostatectomy, and is attended with the lowest mortality.

Malignant growths of the prostate should not, except in rare instances, be dealt with in a radical manner, as the procedure is a severe one, attended by a high mortality, and is followed by a poor functional result. Where benign hypertrophy exists with carcinoma, the benign portion should be removed.

In small fibrous prostates the perineal dissecting operation is performed.

Pauchet⁴ discusses *prostatectomy under local anaesthesia*, meaning by that sacral anaesthesia. When it is probable that infection has occurred, the vasa deferentia are cut to prevent orchitis. To avoid the risk of hæmorrhage the prostatic cavity is packed. In cases of bladder infection, acute retention, distention of the bladder, incontinence, renal and cardiac inefficiency, diabetes, obesity, hernia, and poor general condition, the operation is performed in two stages. In such cases cystotomy and section of the vasa deferentia is not attended by any risk. The second stage of the operation is performed several weeks or, better, several months after the first stage, when the urine is clear and the patient in good general condition. The author uses sacral anaesthesia induced by three injections of 5 c.c. of Corbière novocain-adrenalin solution on each side of the sacrum. The packing is removed after four days. After eight days a retention urethral catheter is introduced. The bladder is closed under local anaesthesia fifteen days after the operation. Healing is usually complete in twenty to twenty-five days.

Ochsner⁵ describes a *two-stage perineal prostatectomy*. The first stage consists in performing suprapubic cystotomy under ether anaesthesia. Drainage is continued for from one to three weeks. The second stage consists in making a perineal incision, incising the urethra, and enucleating the lobes with the fingers. A double drainage tube with perforations is passed into the bladder, and gauze packed round it to control bleeding. The gauze and perineal tubes are removed on the second day, and the suprapubic tube in one week. The patient is allowed up in from three to seven days, and the urine is passed normally in from ten to twenty days.

Soresi⁶ suggests the following procedures to facilitate the surgical treatment of enlargement of the prostate: (1) To prevent skin irritation, the whole operation area is shaved and dried with hot air. For a distance of about 3 cm. around the area where the incision is to be made, the skin is rubbed with ether and then painted with two or three coats of common rubber cement in about five parts of ether. Then apply firmly a sterile piece of sheet rubber (dentist's dam) of sufficient size to cover the upper third of the thighs and the abdomen up to the umbilicus. (2) To prevent infection of the prevesical space, suture the skin to the bladder and do not open the bladder until after adhesions have formed. (3) To prevent post-operative hæmorrhage, use a rubber bag con-

PLATE XXVI.

SUPRAPUBIC PROSTATECTOMY

(THOMSON WALKER)

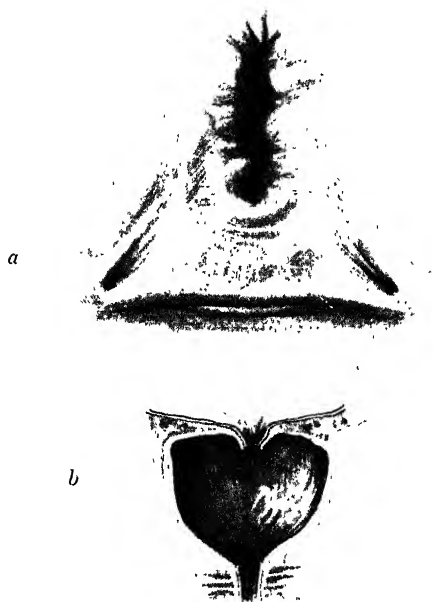


Fig. A.—Opening from bladder into prostatic cavity after prostatectomy; lateral folds of mucous membrane almost in apposition. (*a*) View from bladder; (*b*) Coronal section.

By kind permission of the 'British Journal of Surgery'

PLATE XXVII.

SUPRAPUBIC PROSTATECTOMY—continued

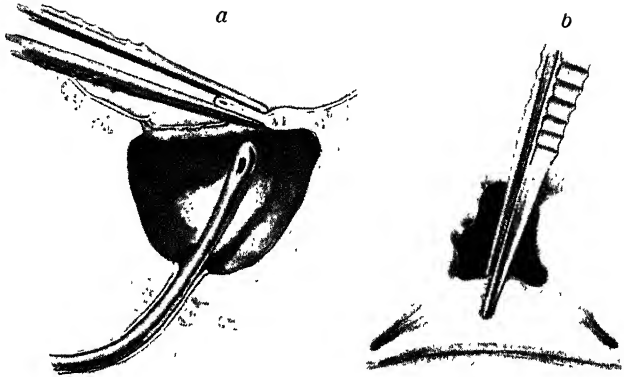


Fig. B.—Canopy overhanging posterior part of prostatic cavity. (*a*) Sagittal section ;
(*b*) View from bladder aspect.



Fig. C.—Nodules of prostatic tissue at the prostatovesical opening.



Fig. D.—Strips of mucous membrane at the prostatovesical opening.

PLATE XXVIII.

SUPRAPUBIC PROSTATECTOMY—*continued*

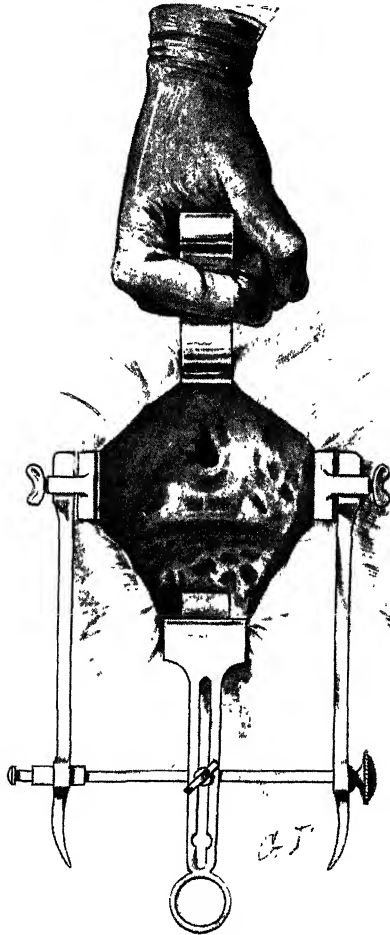


Fig. E.—View of the bladder and vesicoprostatic opening,
with retractors in place.

PLATE XXIX.

SUPRAPUBIC PROSTATECTOMY—*continued*

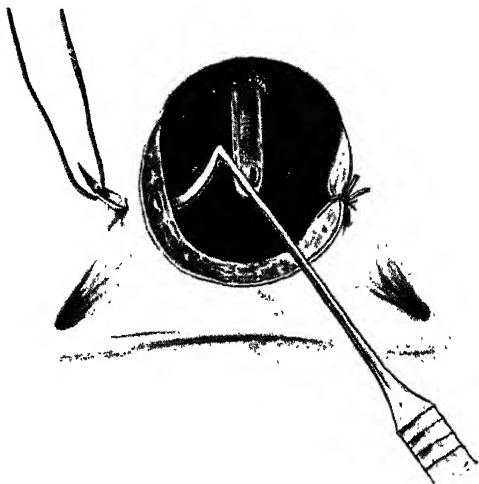


Fig. F.—Introduction of hemostatic stitches at brim of prostatic cavity.



Fig. G.—Prostatovesical opening with wedge cut in posterior fold.

taining mercury to fill the prostatic cavity and, through this, a tunnel to carry a catheter.

Freudenberg⁷ advises the local use of Calcium Chloride for the *prevention of serious hæmorrhages in suprapubic prostatectomy*. For ten to twenty minutes before the operation 100 c.c. of a 6 per cent solution of calcium chloride are injected into the empty bladder. Immediately before the skin incision is made, the fluid is withdrawn from the catheter and air is injected. After the enucleation of the prostate the resulting cavity is plugged tight with medicated gauze soaked in the calcium chloride solution. Above this a large-sized tube is inserted. The remaining cavity of the bladder is also plugged with the gauze soaked with calcium chloride solution. The tampon in the prostatic cavity is not removed for three or four days. For bladder lavage, during the first few days following the operation, calcium chloride should be added as a precaution.

In discussing prostatectomy, Bugbee⁸ states that he uses a Hagner bag or a Pilcher modification to control hæmorrhage in all cases. The method is more satisfactory than packing or suture or the use of a flap of tissue. The author has not seen secondary hæmorrhage on removing the bag twenty-four hours after the operation. Bugbee, unlike many American writers, does not allow his patients to get up before the drainage through the wound has ceased.

Thomson Walker⁹ describes an open operation for the prevention of hæmorrhage and post-operative obstruction in suprapubic prostatectomy. Severe bleeding occurred in 10 per cent of cases, and really serious hæmorrhage in about 1 per cent. The direct mortality from hæmorrhage was small, but loss of blood was the contributory, if not the deciding, factor in cases of death from shock, cardiac failure, syncope, exhaustion, asthma, and other causes. The worst cases of hæmorrhage were those where the bleeding during the operation was slight and hæmorrhage commenced after the operation was over. High blood-pressure encourages bleeding, and large prostates bled more freely than small.

Post-operative obstruction should not be confused with atony from nervous disease or idiopathic atony. Post-operative obstruction might take place by the formation of scar tissue at the internal meatus where the vesical mucosa was torn, or at the membranous urethra where the urethra was torn across. A canopy (*Plates XXVI, Fig. A, XXVII, Fig. B*) was formed by the bladder base overlying the posterior part of the prostatic cavity, and this might unite with the lateral and anterior aspects of the internal meatus, and partly or completely occlude the opening, and a suprapubic fistula would form. Loose nodules or shreds of mucous membrane (*Plate XXVII, Figs. C, D*) were frequently left behind after a prostatectomy, and caused intermittent obstruction and suprapubic fistula.

The operation the author practised to control hæmorrhage and prevent obstruction consisted in enucleating the prostate with the finger and then turning the patient into the Trendelenburg position. The interior of the bladder was freely exposed by the use of the author's bladder retractors (*Plate XXVIII*), clots were cleared out, and long pressure-forceps placed on the bleeding points, which were then tied with catgut sutures passed through the margin of the prostatic cavity by special needles (*Plate XXIX, Fig. F*). All tags, strips, and nodules of gland tissue were removed. A deep wedge with the base forwards was cut out of the canopy overlying the posterior part of the prostatic cavity in order to prevent contraction or obliteration of the outlet (*Plate XXIX, Fig. G*). The sphincter of the bladder after prostatectomy is the compressor urethræ, so that there is no danger of incontinence after this operation.

Rockey¹⁰ describes what he names the 'prostatic-ambulant post-operative treatment'. Post-operative irrigation he considers "a surgical error. It promotes the continuance of bleeding, devitalizes the freshly-exposed tissues, and favours the formation of sloughs by removing the blood-clot which is the natural hæmostatic and protective of the wound". [These statements are not likely to find acceptance among urinary surgeons in this country.—J. W. T. W.]. The patient usually sits up in bed on the second day, gets up in a wheel-chair on the third, and walks about as he pleases on the fourth.

Kondoléon¹¹ records two cases of *enlargement of the mammary glands after prostatectomy*. Soon after healing of the suprapubic wound, in one case and in the other both mammary glands became enlarged to the size of a walnut, hard and tender. The enlargement remained stationary for several months, and then gradually subsided. The author suggests that the deprivation of an internal secretion of the prostate permitted the increased activity of the mammary gland.

Spittel¹² describes the symptoms, diagnosis, and treatment of *prostatic calculi*, and quotes three personal cases. These calculi may arise in the substance of the prostate gland, and consist of a nucleus of corpora amylacea, with varying amounts of calcium phosphate and carbonate. They may form in pouches communicating with the prostatic urethra. They may be lodged in the prostatic urethra while passing from the kidney or bladder. The author prefers the perineal route for the removal of these calculi.

Hubney¹³ finds that prostatic calculi occur comparatively frequently, and are usually confused with chronic prostatitis. A diagnosis can be made by means of the x rays, which throw a definite shadow.

Aschner¹⁴ describes a case of *chronic abscess of the prostate* which he treated by intra-urethral manipulation. The abscess had ruptured into the urethra in the right prostatic sulcus. The opening was small, and was enlarged by forceps and scissors through the cysto-urethroscope, and then dilated with olivary bougies and washed out through a catheter introduced into the abscess cavity. The whole treatment lasted nearly twelve months.

REFERENCES.—¹Wien. klin. Woch. 1920, May 13, 419; ²N. Y. Med. Jour. 1919, Dec. 6, 942; ³Ibid. 1920, Jan. 24, 135; ⁴Surg. Gynecol. and Obst. 1920, March, 224 (abstr.); ⁵Ibid. Aug., 150 (abstr.); ⁶Ibid. July, 69 (abstr.); ⁷Berl. klin. Woch. 1919, Oct. 13, 967; ⁸Boston Med. and Surg. Jour. 1920, July 15, 80; ⁹Brit. Jour. Surg. 1920, vii, 525; ¹⁰Surg. Gynecol. and Obst. 1920, Feb., 206; ¹¹Centralb. f. Chir. 1920, Sept. 4, 1098; ¹²Surg. Gynecol. and Obst. 1919, Nov., 397 (abstr.); ¹³Ibid; ¹⁴Ibid. Dec., 610.

PRURITUS ANI. Treatment by **Electrotherapy** (p. 36).

PSORIASIS. (See also SKIN, GENERAL THERAPEUTICS OF.)

E. Graham Little, M.D., F.R.C.P.

Sabouraud¹ contributes an interesting paper on this disease, which he regards as incurable. Diet, he is convinced, has no influence on it, and he even throws doubt on the evil effect usually ascribed to alcoholic excess. He comments at length on the method of inoculation with toxins of bacterial origin extracted from the feces, associated with the name of Danysz, and rejects the hypothesis that their action is in any sense specific, and seems to regard the method as neither better nor worse than the many panaceas which have failed to obtain the results promised by their promoters.

O'Brien² records two cases of psoriasis occurring in infants of 2½ and 1½ years respectively, both females, and in both instances the mothers were also affected with the disease. He thinks Arsenic is still the best drug to administer internally, except in acute phases, when he prefers to give *Liquor Potassæ* in 10-min. doses, well diluted with water. Of local remedies *Chrysarobin* is

the most effective, and he recommends an ointment containing 18 gr. to the ounce, with Salicylic Acid and Ichthyol. For the scalp, Oil of Cade and Sulphur are preferred, chrysarobin being inadmissible here. X Rays he uses only for rebellious patches and when of restricted extent.

Bory³ has somewhat modified his prescription of Sulphur Injections (*see* MEDICAL ANNUAL, 1918, p. 437), and now uses this formula:—

R Sulphuris Præcipitati	1 grms.	Eucalyptol	20 grms.
Guaïacol	5 grms.	Oleum Sesami	ad 100 c.c.
Camphoris	10 grms.		

A dose of 6 to 10 c.c. is given, at weekly intervals, a series of four or five injections being a usual course. Five to eight hours after injection the patient may feel a disagreeable tension at the site of injection—which is preferably given in the afternoon—and the patient may have a cachet of Pyramidon in the evening, and remain in bed the next day. The symptoms are quite quieted down within twenty-four hours. It is well to examine urine and lungs before treatment. Combined with the injections pure Coal Tar should be painted daily on the lesions. The author claims that the average duration of treatment is only three weeks. He advises an occasional injection—e.g., 10 c.c. every month or two months—after the eruption has disappeared.

Remer and Witherbee⁴ advocate X-Ray Treatment even in cases of extensive psoriasis, and describe their system as follows:—The exposures are preferably given three times a week, allowing a day between each. For the first treatment head and arms are exposed; the second, trunk and buttocks; the third, legs and thighs. The head is divided into five areas, as in the Adamson-Kienbach method for ringworm of the scalp; the arms, forearms, and hands into four areas each, two flexor and two extensor; the trunk into eight areas, four ventral and four dorsal; buttocks, one area for each; the leg and thigh into six areas, three anterior and three posterior. The dose given is one-eighth of a skin unit to each area of the scalp each week until four treatments are given. Then scalp treatment is discontinued for four weeks, and if necessary a second series of four treatments is given. After another four weeks a third series is given if necessary. To each of the areas of the body one-fourth skin unit is given each week until the lesions have disappeared. The treatment is concluded in from four to eight weeks.

The method of working out the skin unit with reference to the particular tube used is complicated, and is given *in extenso* in an earlier paper.⁵

REFERENCES.—¹*Med. Press and Circ.* 1920, Sept. 1, 162; ²*Ibid.* Sept. 15, 208; ³*Ibid.* March 3, 175; ⁴*Med. Record*, 1920, Aug. 28, 355; ⁵*Amer. Jour. Roentgenol.* 1917, June 17.

PSYCHOLOGICAL MEDICINE.

J. A. Hadfield, M.A., M.B., Ch.B.

The past two or three years have been marked by the establishment of psychotherapy as an accepted method of medical treatment. Throughout the country, where men have been available, clinics have been set up in hospitals, either independently, or as adjuncts to the existing neurological departments. In other cases special clinics like that at Liverpool and the recently formed Tavistock Clinic in London* have been founded for the clinical treatment of functional nerve disorders. A special lectureship in Birmingham University, special courses of lectures at Maudsley, in Edinburgh, and elsewhere, indicate the advance that is inevitable in this branch of medicine. Neurologists of note once hostile to the psychological conception of the functional nervous disorders are recognizing its worth. "I have," says Sir Frederick Mott¹ in

*51, Tavistock Square, W.C.

a book whose value is enhanced by the recognition of both aspects of the question, "from a far greater experience, come to recognize the fact that the psychogenic factor is the dominant causal agent in 'war psychoneuroses', and that a large proportion of cases which were regarded as shell-shock did not owe their condition to any pathological changes which would have been recognizable in the central nervous system by any known methods of microscopic investigation: in fact that they were functional psychoneuroses". This change in opinion has been signalized by the general adoption of the term 'psychoneurosis' instead of 'functional nerve disorder'. The latter implies merely that no organic change can be detected to account for the symptoms; the former, 'psychoneurosis', frankly admits the psychogenic origin of these diseases (Bernard Hart²).

THE SCOPE OF THE PSYCHONEUROSES.

The scope of the psychoneuroses is still undefined, but may be taken to include those diseases which are preponderatingly, though not necessarily entirely, psychogenic. The dividing line between organic and psychogenic being itself undefined, the term psychoneurosis may be used clinically to describe all diseases in which no organic basis can be detected by clinical methods.

CAUSATION OF THE PSYCHONEUROSES.

A.—Predisposing Causes (Gordon³).—These may be divided into: (1) Hereditary; (2) Early environmental; (3) Immediate predisposing.

1. *Hereditary Causes*.—The 'nervous temperament' is an hereditary characteristic. *Physiologically*, the nervous temperament may be due to the relative weakness of synaptic resistances, so that nerve impulses tend to flow too freely across these synapses, and produce the unsteady nervous system, the unbalanced mind. It may be described *psychologically* as one in which the instinctive emotions, fear, sex, anger, are very near the threshold of expression—the controlling elements being comparatively feeble.

The instincts themselves, with their accompanying emotions, must also, of course, be regarded as hereditary (McDougall⁴). It is generally agreed that the psychoneuroses are chiefly connected with the *emotions*, such as sex and fear. Such emotions are normally kept in check, but when associated with a nervous system in which the synapses are 'open', these emotions tend to flood and dominate the mind. A very little excitant will unbalance a man with such a nervous constitution. This neural factor in nervous breakdown has not been sufficiently recognized (C. Dana⁵).

2. *Early Environmental Causes*.—There are few cases of true psychoneuroses in which early environmental conditions have not played an important part. It is even said that a psychoneurosis is never produced by a trauma later in life, but invariably dates back to a predisposing cause in childhood. Whether this be the case or not, and there is much to support it, it is certainly true that *our attitude towards life* which predisposes or otherwise to neurosis is determined in childhood.

It is to early environmental conditions that we must ascribe many neuroses which were previously put down to heredity. It cannot be too strongly insisted upon that a patient does not inherit a symptom acquired by his parent. The same law applies in psychopathology as in tuberculosis—one may inherit the predisposition, one does not inherit the disease. The nervous temperament may be inherited: alcoholism, or fear of trains, is not. Such symptoms, however, are often *acquired* by suggestion from a parent in very early years—e.g., a patient who suffered from a condition of tremor of the

hands was said to have 'inherited' it from his father, but on analysis it was found to be due to an early forgotten experience: at the age of three he was undergoing a painful operation and his hands were held down by his father, who himself had shaky hands. The feeling of unavailing struggle against superior force was thereafter symbolized by this tremor, and in any such circumstance in later life the tremor emerged.*

3. *Predisposing Physiological Causes.*—The same neural synaptic disturbances as those described as due to the 'nervous temperament' may also be produced by toxæmias, fatigue, and endocrine instability, which may make the nerves more irritable or less irritable, and the synapses more or less resistive, thus rendering the patient more liable to emotional strain and shocks. This physical factor has been recognized, perhaps too exclusively, by those who treat the psychoneurosis by physical methods only (T. Lumsden⁶).

PSYCHORGANIC CASES (C. Dana,⁷ J. S. Bury⁸).—In the psychoneurosis proper the psychogenic factor predominates over the organic, and the cure of the mental condition induces a complete cure. On the other hand, in the 'organic' cases there may appear psychological disturbances, irritability, delirium, and so on, which are cured only when the organic condition is rectified (Hart²).

But there are cases in which the etiological factors of the physical and the psychical are so inter-related that we fail to cure either without attacking both. In these 'psychorganic' cases the disease must be attacked from *both* sides.

Amongst such cases are the toxæmic-psychic examples. It has often been pointed out that a soldier suffering from physical fatigue, through want of sleep or arduous marches, is much more likely to fall a victim to the psychoneuroses, whereas without this physical handicap the mind could have held its own and been saved from the collapse. So it is with the toxæmias of civil practice. There are psychical causes in these cases, but these are not of themselves sufficient to produce the disease; there are organic toxæmias, but hundreds of people with as bad or worse toxæmias (but with no worry) carry on with impunity. But the combination of these two factors produces a form of psychoneurosis which is extremely resistive and requires combined treatment. These are the cases which, if at all advanced, need nursing-home treatment, which is peculiarly adapted to these forms of disease. The influence of the psychic element in the etiology of exophthalmic goitre has long been recognized, though its resistance to psychotherapeutic treatment alone suggests a mixed origin. Probably in the future many forms of disease, such as exophthalmic goitre, tinnitus aurium, and others, will be numbered amongst the curable diseases when treated by *both* psychotherapy and physiotherapy, even though they have resisted treatment by *each* of these separately. The psychotherapist should always number amongst his personal and professional friends an aurist, a throat specialist, and a dentist—the last-named being of the type who thinks more of saving the patient than the teeth, and who possesses a radiographic apparatus which will expose the abscess at the root of the crowned tooth.

Even when the focus of toxæmia is removed, and with the use of vaccines, the effects of the toxæmia require weeks, and sometimes months, to pass away; it is therefore a good principle to remove the focus, and postpone the psychotherapeutic treatment for a few weeks. When this class of 'psychorganic' disease is generally recognized, there will be less conflict in treatment between the 'organic' neurologist and the psychotherapist.

* The analysis was confirmed by the cure of the patient's symptom.

B.—Immediate Causes.—All psychoneuroses are due to a failure in adaptation to life (H. Patrick,⁹ D. Yellowlees¹⁰). The production, therefore, of such a disease will depend partly on the severity of the stress of life and partly on the ability of the individual to bear the strain. The balance of these factors, the predisposing mental factor and the immediate environmental conditions, determines the disease and affects the prognosis. If the individual's mental condition is comparatively strong, but the circumstances overwhelming (as in shell explosion), the prognosis is good, other things being considered. But if the previous condition of the patient was poor, and the trauma relatively slight, the prognosis is worse, and longer treatment will be required. The preponderance of one or another of these factors gives rise to two distinct clinical types, the one patient being characterized by 'arrest', the other by 'regression' (see below).

PSYCHOPATHOLOGY.

A.—Psychogenic and Organic Factors.—It is a commonplace that psychogenic disorders, especially those associated with the emotions, may produce effects of a physical nature. The influence of the emotions on physiological processes seems to take place chiefly through the autonomic nervous system. Anxiety may produce diarrhoea; worry frequently produces constipation. Fear, even without external stimulus, may produce contraction of the arterioles and blanching of the skin; and shame produces dilatation. Experiments made by the present writer¹¹ prove that superficial body-temperature can be raised or lowered, arteries contracted and dilated, by suggestion alone. If we may assume that the emotions operate by means of the autonomic nervous system, we may expect them to influence the muscles under the control of this system, and thus help to account for such cases as the boy who died from jaundice as a result of mental shock. An emotion that can contract the arterioles should conceivably be able to contract the bile-duct.

An illustration of the necessity of recognizing the mental factor is to be found in the vomiting of pregnancy (Hurst¹²). The physiological factor has always been recognized; changes necessitated by the establishment of the placental circulation cannot fail to cause disturbances, which may produce vomiting. But vomiting, we know, may arise from psychical causes (it is incorrect in these cases to speak of 'cerebral' vomiting): we vomit at a horrible sight, or at the reception of bad news. The mind, like the stomach, may be 'disgusted' (bad taste), and symbolize its rejection of the mental bolus by vomiting. An examination of such a patient's dreams reveals to us a mental drama produced by the conflict of three basic instinctive emotions—self-preservation, the sexual instinct, and the maternal. The necessity of the maternal instinct establishing itself is biologically evident, but this means the repression of self-preservation in facing the dangers of childbirth, and also of the sexual instinct for the time being. A psychotherapy, whether in the direction of suggestion in favour of the maternal emotion, or of analysis to release the repressed maternal instinct, hastens the process of mental adaptation.

A further question relating to the organic and functional is whether functional disturbances can produce organic disorders. This is particularly important in a disease like epilepsy (T. H. Weisenburg,¹³ Gordon¹⁴), which, in the early stages of the disease, is so difficult to distinguish from functional conditions. A soldier will lose consciousness for a few seconds and then proceed with his work, *simulating petit mal*, yet it may be found that the temporary dissociation was produced by some suggestion which for a moment transferred him mentally back to France. There may be some ground for accepting the term 'hystero-epilepsy' to describe a group of cases which are

not merely hysterical cases simulating epilepsy, but hysterical cases passing into a true epilepsy. That the later stages of epilepsy are associated with organic changes is undoubted. It is not inconceivable that violent hysterical fits, with the arterial tension they produce, should lead to changes in the meninges which later become an epilepsy of a more serious type. The present writer has had two cases of 'fits' in which a typical Babinski's extensor reflex was present after the fit, as in epilepsy, but which were undoubtedly psychogenic and due to war experiences. The fits consisted of a reproduction of the struggle when the patient was buried. They could be induced by hypnosis, and were cured by psychotherapeutic treatment, but yet presented this organic reflex sign. It is suggested that these patients might have gone on from a hysteroid to an organic epilepsy had they not been cured by psychotherapeutic treatment.

B.—Psycho-analytic: Arrest and Regression.—Life consists in the successive emergence and development of vital impulses necessary to an adaptation to circumstances.

1. *Arrest.*—When at any period in life this development is arrested, we become henceforth unfitted to meet the demands of life, and even a slight shock will plunge us into neurosis.

Mental arrest may be brought about in two ways: (a) When the earlier stage of development proves too attractive. For instance—the child who has been 'coddled' by its mother and therefore prefers to linger in the condition of protection represses the higher calls of independence: it refuses the new because it says "the old is better". Or again, a married woman may cling too strongly to the sexual, and not develop the maternal for this same reason. A boy may be arrested in the heroic period of pirates—like Peter Pan—and never grow up; or a girl may disappear into worlds of fantasy—like Mary Rose. (b) There may be some abnormal psychic trauma that *fixates* the impulse so that growth is arrested. So the boy, who at puberty is normally homosexual (using this in the non-perverted sense) towards the gang, may be denied this impulse and have it attached morbidly to an individual: in this case the boy tends to remain homosexual. The mental development is arrested in either form, and this predisposes the patient to neuroses.

2. *Regression* (M. Nicoll¹⁵).—In other cases impulses have developed comparatively normally, but the individual is then brought up against some severe stress, and the mind fails to maintain its progressive attitude, and undergoes a 'throw back' to a more primitive condition, which is spoken of as 'regression'. A number of patients in the present war have regressed to childhood and become as little children.

These two forms of morbid mentality—the arrested which has never grown up, and the regressive which has grown up but finds adult life too severe—are distinct, and need different treatment. It is far easier to restore a function once developed but temporarily suspended, as in most cases of war neuroses, than to nurture into life the starved arrested soul, to liberate forces that have never known expression, to expand the shrivelled lungs of the neurasthenic who has never known what it is to breathe deeply of life.

C.—Neurological.—These general facts have, however, been variously described, in terms other than those of psycho-analysis. Looking at the problem from the physiological point of view, Head¹⁶ describes the nervous system as consisting of a hierarchy of systems each of which exercises an inhibiting influence over the systems below it. The higher systems like the cortex are of course more delicately constructed, and therefore are more liable to shock. When the higher control is removed, 'symptoms' result, these symptoms, as Hughlings Jackson taught, being due not to destroyed tissue but to the normal operation of the lower centres unrestrained by the higher.

D.—**Biological.**—Others, again, describe the neuroses in terms biological rather than purely physiological, and find in the various symptoms of the neuroses manifestations of the activity of the various instincts. We find the symptomatology elucidated by a conception of the instincts such as has been enunciated by McDougall.⁴ Such a conception would be more 'biological' than that of the more orthodox psycho-analytic school, and would take its stand on the predominance for life of the various instincts and their emotions, and not of the one instinct of sex, as represented by the Freudian school, nor upon a mythical interpretation of life according to the Swiss school.

Failure to adapt oneself to circumstances implies failure to control the instincts and to redirect them into those higher uses which it is the function of civilized culture to develop. The instincts therefore return to their more primitive modes of expression. When the patient, finding life too much for him, cannot maintain the higher (and therefore more delicate) systems of life, he regresses, and the regression is back to the instincts in their primitive form.

The *symptoms* of the 'neurasthenic' are the characteristics of the early forms of instinct. The *instinctive emotion of fear* normally manifests itself in flight, or, failing that, in concealment. The war-shocked soldier often responds to life in this manner. He suffers from constant *tremor* which normally represents alertness and preparedness for flight; but flight being restrained, it becomes a morbid and continued symptom. Failing that mode of expression in flight, the primitive reaction is one of *concealment*—and is manifested in the desire of the soldier to be by himself, to be alone, in a shrinking from his fellows, and a fear of crowds. Fear, manifesting itself in this tendency to concealment, over-rides the gregarious instinct which normally urges him to seek for the companionship of others.

An altogether different symptom is expressed in a *fear of being alone*, which also characterizes some cases; such cases present a craving for the expression of the gregarious instinct—like the fear of so many animals of being separated from the herd—and a craving for protection.

More specific symptoms are to be explained in the same way. "As is well known, mutism, paraplegias, paræsthesias, blindness, deafness, amnesia, are common during the strain of battle. All these are disorders which incapacitate a man from service and cause his removal from a dangerous area to safety; in this way they serve the instinct of flight, which, like other instincts, is teleological or purposive in its conative aspects" (Carruthers¹⁷).

The instincts of *self-abasement* and *self-assertion* are also otherwise manifested in marked degree in the psychoneuroses. In self-abasement, "the patient shrinks from the observation of his fellows, thinks himself a most wretched, useless, sinful creature" (McDougall¹⁸). This patient mixes with his fellows often enough, he does not seek concealment for fear, he often shows no signs of fear, but he is crestfallen, apologetic, and self-deprecating.

Failure in war, in love, in reproduction, brings into play the *instinct of self-abasement*, the object of which "seems to be the propitiation of a superior power or the eliciting of sympathy or pity". "Hysterical manifestations are commonly found to follow an incident such as an unfortunate love affair, a painful or terrifying incident, or failure to fulfil the instinct of reproduction. The goal of the instinct is to elicit pity, sympathy, or attention from other people. In modern civilized life the best way to do this is to be ill." On the other hand, who has not met the self-assertive 'neurasthenic' soldier, who sports a wound stripe for having been to hospital with a cold, and is always in the foreground when the press representative is nigh?

This method of classifying symptoms, by tracing them to the instinctive

emotions which are operating in their determination, will probably gain favour in this country, and may give rise to a more distinctively British school of psychotherapy. It would trace the neuroses back to the instinct, thus discover the instinctive emotion that requires satisfaction, and then redirect the emotion to ends satisfying to the individual and of value to the community. A thorough analysis would analyze out all the instincts in this way, and, directing them to such ends, would produce a condition of health and happiness in the patient.

E.—Suggestion.—Many of the symptoms of the neuroses are produced by 'suggestion'. Babinski gives the name of hysteria to those conditions which are produced by suggestion and which can therefore be cured by psychotherapy. Such symptoms are functional vomiting, functional paralysis, anaesthesia, and so on (Hurst¹²). But this definition of hysteria is rarely accompanied by a definition of suggestion, which is the process by which ideas are introduced into the mind without being submitted to the critical judgement. Suggestibility itself is closely associated with the instinct of submission, instinct processes being conditioned by the withdrawal of the reasoning processes and the subsequent surrender of their judgement to that of the herd, or accepted authority. Such patients are certainly suggestible, but they are not suggestible to *any* form of suggestion. The most 'unsuggestible' people we have met are those who are the victims of their own auto-suggestion, namely the typical hysterics. Therefore, as most writers agree, the patients suffering from functional paralyses are much better treated by persuasion—that is, by an appeal to their reason—than by suggestion, an appeal evading the reason.

At present the classification of symptoms is in a deplorable condition. The term 'neurasthenia' is used by some to cover all the psychoneuroses, by others to refer only to conditions of physical nerve exhaustion. 'Hysteria' is disease caused by the floating of the womb about the body—the term should die with the disease. But hysteria is used by some to signify the functional neuroses that manifest themselves in symptoms of the central nervous system, whilst 'anxiety neurosis' is used of the autonomic system—sweating, and so on. On the other hand, hysteria is used by Babinski to describe the diseases produced and curable by suggestion, but he proposes to substitute for it the word pithiatism. Of the uses of the word 'repression' we shall write later. Words like psychosis, psychasthenia, obsession, need more specific definition, and there is urgent need of a new dictionary of psychopathology.

Some confusion is of course inevitable in any new science, and those who make the language of the science are placed in the difficulty of choosing either to coin words which sound as jargon to the sensitive ear of the layman, or to employ words in common use for specific senses. Meanwhile we must be patient, and recognize that there are not only important facts but also important differences beneath the various uses of these words.

TREATMENT.

We do not treat the symptoms, we treat the person (Patrick⁹). (D. Yellowlees¹⁰).

In every mental process there are three phases—the afferent, the central or emotional, and the efferent: cognition, emotion, and conation. A neurosis may be produced at any phase—at the afferent, e.g., by a trauma in childhood; at the centre, by the repression of the emotion; or at the efferent, by the misdirection of the psychological energy, and its attachment to morbid entities. The schools of psychotherapy differ therefore in their treatment as to which of these phases of mental process they emphasize—whether they

pay attention to the stimulating and irritating cause (as the analytic school), the central emotion (represented by the 'suggestion' school which tends to repress still further the morbid emotion, and the 'abreaction' school which on the contrary aims at letting out the emotion), or the redirection of the energy from the more primitive form to a more civilized form of reaction (re-education).

Each of these schools gets excellent results by its methods, for each is concerned with the same mental process, though their activities are devoted to different phases of this process. The analyst cures by simply analyzing; the abreactionist by letting up the emotion; the re-educator finds that emotion is unnecessary, but quiet studied talks and right thinking are all-important: but each is dealing with the same general mental process.

Another reason for the general success of all methods is to be found in the type of case treated. One school advertises—there is no other word for it—successful cures by persuasion; but it is found that the cases cited are practically all 'hysterical', that is, cases of the paralysis and aphasia type, and mention of the anxiety group is conspicuous by its absence. It is probably true of other schools, too, that their successes depend, not merely on the form of treatment, but on this treatment as applied to special types of case. We shall therefore never arrive at a sound scientific psychotherapy until clinicians report their failures. These cast no reflection on their successes: they only imply that their form of treatment is not applicable to some types of the psychoneurosis, which may, however, be more appropriately dealt with by another form of treatment.

1. Redirection of the Psychophysical Energy.—Taking the treatment of the efferent phase first, the distinctive method used is that of *persuasion*. Since the neurosis is caused by the removal of the higher controlling systems and the surrender of the mind to the lower and instinctive, the obvious mode of treatment is to attempt to restore that control by reasoned argument. This method was adopted by Dubois²⁰ and Dejerine.²¹ It is of great value in the localized functional or conversion neuroses, such as functional paralysis, aphasia, or vomiting. It is also of value when, as near the front line, the patient is under great emotional stress. Quiet reassurance will often inspire a nervous patient with confidence. It acts on the principle that emotion checks thought, and conversely that thought regulates emotion. The emotion, instead of being diffused through the autonomic nervous system, is dispersed in the higher cortical centres and under control of the reasoning centres. Thus T. Williams²² says, "The essential of all this is the change of the subject's *notion* as to the meaning of the situation which provokes the emotion. The emotion cannot be changed until the subject envisages the situation differently. In other words, the phenomenon depends upon perception, observation, cognition, and intellection. The emotions that flow through are secondary." That is, the neurosis depends on the way in which the patient intellectually reacts to the emotion. "Taken early enough, this prevents the emotion from fixing itself on to some obsessive idea or hysterical disorder". Williams, however, recognizes the necessity of recovering the amnesias before proceeding with the educative method.

Wide²³ "gets rid of trance-like reactions in bombarded soldiers by obtaining access to the patient's understanding, towards which change of aspect the patient inevitably reacts emotionally". Says Wide, "I have always been able to find the words necessary to prevent the fixation of the affective obsessions, deplorable in either the individual or in the community".

2. Forms of Treatment which deal with the Central Emotion.—These are two in number and directly opposed: (a) The 'suggestion' school; (b) The 'abreactive' school.

a. *The Suggestion Method.*—This aims at suppressing still further the morbid emotion, and helping the patient to substitute confidence for anxiety, courage for weakness of will. It regards the repression of the emotion as a protective agency. The form of suggestion usually employed is that of hypnosis. In cases in which the emotion is already effectively repressed but has given rise to a symptom (e.g., an obsession or paralysis), suggestion can only attack the symptom and attempt to repress that. Suggestion treatment is found valuable in mild cases in which a prolonged analysis is not desired or possible; it is also valuable where the patient is passing through a phase of severe stress and anxiety, and needs moral support; timely suggestion might save many a person from suffering a nervous breakdown, which would then require more prolonged analytic treatment; and, further, suggestion is valuable in cases of old people who are suffering from a 'mental arteriosclerosis' too advanced for analysis to be employed.

In describing suggestion as a repressive agency, we must not blind ourselves to its positive worth. In repressing a morbid emotion we give the higher centres an opportunity to regain their functions of control, and thus a permanent cure is established.

There is no reason why any medical man should not become skilled in the use of suggestion. Though the principle in suggestion is in antithesis to that of analysis, they are not necessarily contradictory. They represent in psychotherapy merely the difference between conservative treatment and operative treatment in surgery.

b. *The Abreactive Method.*—Most psychopathologists now regard amnesia as a constant accompaniment of the neuroses—the patient has almost always forgotten the *real* cause. Since symptoms are caused by the repression of the emotion, the cure is brought about by the liberation of the emotion, which is often, most startlingly manifested under hypnosis.

Myers²⁴ does not consider that what is repressed is the emotional, but only the unpleasant. The emotional is dissociated, he admits, and "is left free to wander into other fields of cognition", but it is the *cognitive* experience which is repressed, and which must be recovered into consciousness.

In support of this, we have the undoubted fact that in many cases the recovery of the amnesia without any sign of emotion is sufficient to cure. This proves that 'abreaction' is not *necessary* to cure. Again, one has had cases in which the emotion has been fully expressed in hypnosis, but in which the patient was not cured until the memory was recovered to his normal waking consciousness. The cure here was obviously not analogous to 'letting off steam'. Nevertheless, if we assume the necessity of recovering an idea, the more vividly we do so the better—viz., by recovering it with all its emotional tone.

The question here emerges: Why is it necessary to bring up the amnesia or repression at all? Repression seems so obviously the natural and ethical means of protection (Sir J. Crichton-Browne²⁵). That repression is protective is so far true; but repression is not the only means of protection. Nature tries to throw off a morbid idea in the mind as she does a foreign body in the tissues; it is only if she fails to do so that she surrounds the latter with scar tissue and represses the former. Furthermore, as in surgery we encourage and adopt nature's primary purpose by extracting the noxious body, so by the mental surgery we seek to eradicate the repressed complexes. This one is able to do with all the less hurt when the original cause of the repression has passed away, as in war neuroses.

We may then describe three stages in adaptation or modes of dealing with the painful situation: mental adaptation to the 'environment'; protective

repression of the emotion aroused by it when adaptation fails ; and methods of mental surgery.

These processes are well illustrated in the case of a patient suffering from aphonia and headaches, who also had a protective amnesia which repressed the painful memories of France. He took a walk in London in the course of which he passed under an enormous crane. On his return to hospital he dreamt vividly of his forgotten experiences in France when he was buried. The natural recovery of this lost memory, initiated by his passing under the crane and fearing its fall, brought with it the recovery of his speech. Nature was here using the cathartic method instead of the repressive previously employed. Even with so broad a hint as to the right method of cure, his medical officer continued, so the patient says, to give him drug treatment only for his continued headache. Following nature's lead, but using hypnosis, we recovered a lost memory of another trauma, and thus cured his headaches. This patient in the course of his cure passed through three phases of treatment—the repressive, the abreactive, and, finally, artificial recovery of his amnesia.

3. Treatment dealing with the Exciting Cause: Analysis.—The two great schools of psycho-analysis—the Viennese and the Swiss—have in this last year shown a tendency to diverge further apart rather than to exhibit any signs of unity. There are those on both sides, including the leaders, who now say that reconciliation is impossible. A discussion of their positions is of course out of the question ; nor has there been any radical alteration in these during the past year. But since psycho-analysis depends so much on the idea of 'repression', we shall illustrate the essential difference between those schools by indicating the difference of interpretation given to this word.

Repression to one school is repression of material that is rejected either because of its painful nature, or because it is out of keeping with conventional moral life ; whereas repression may otherwise be considered as the repression of the vital forces, and the consequent failure of the person to adapt himself to circumstances. This is a radical distinction : in one case it is the repression of all that is conventionally regarded as 'bad', and what is contrary to herd or moral feeling ; in the other case the repression is of something good, vital, and necessary to life. A lady who suffers from dyspareunia is found on analysis to owe her condition to a sexual assault in childhood, long since forgotten : she suffers from a repression of the former kind. Another lady who, in her craving for sexual gratification, unconsciously represses her maternal instinct towards her children, is suffering from a repression of the latter kind. The former is the repression of something painful and unnecessary, the latter of something valuable and necessary to health. Hence the insistence of the Swiss school on the idea of rebirth at various stages of life as being necessary ; and their theory that neurosis is developed owing to a reluctance to pass on from one stage of life to the next by this process of rebirth.

The emphasis of these two schools therefore varies, in that the former concerns itself almost entirely with the reactions and incidents of childhood, and even pre-natal life ; whereas the latter concerns itself more with the present problem of the patient. Again, the former finds in dreams reference to infantile sexual phantasies, whereas the latter looks to dreams for an indication of the present problem. To the former the sexual is alone real ; to the latter it is often, in dreams, symbolic of high mental functions, such as the sense of mastery.

Dream interpretation, in spite of the enormous advance it has made in recent years, is still on an unsatisfactory basis. This is obvious when we consider that two schools, both following the same scientific procedure of analysis, but

with a different theory of interpretation, can come to such divergent conclusions as do the Viennese and Swiss schools. The former sees in dreams nothing but the expressions of infantile sexual wishes, and regard them as being of the same nature as neuroses (Stoddart²⁶). "Neuroses, psychoses, and dreams were fundamentally the same, the only difference being that the neurotic or psychotic lived his dreams." They are a safety-valve to gratify repressed desires. The Swiss school regard the dream as purposive in character, dealing with the present problem of the individual, and therefore look to dreams for an indication (1) of what the problem is, (2) of a solution to that problem. Dreams are thus teleological in character rather than voluptuous.

In both of these theories—and they are both theories still requiring proof—the biological element has been too largely neglected. Biologically considered, dreams, like play, prepare us for life. If I go cliff-climbing and slip slightly, I dream at night of falling down the cliff and clutching at this rock or that shrub to save myself. This serves as 'experience', so that if on any future occasion I actually do slip badly, I have all this previous experience to go upon.

But the psyche has not only problems, difficulties, and dangers of the objective world to face: it has to face its own problems also, and it seeks to do so by employing symbols from the objective world, and it is the interpretation of these symbols which gives rise to such hot blood. The crude interpretation of symbols is well illustrated in a paper by Stoddart.²⁷

Two questions remain. Firstly, if analysis is considered desirable, how far is a full and complete analysis necessary? Secondly, what grounds have we for believing in the permanence of cure?

It is agreed that a complete analysis necessitates months of treatment and considerable expense. The war, however, has proved that men may be made efficient by a much shorter and more rapid analysis.

1. In the majority of cases in which the neurosis is primarily due to the traumatic factor in a fairly normal individual, a short analysis of the immediate cause is sufficient; whereas in the cases of early arrested development a more prolonged analysis is required: Where the severity of the trauma is relatively great as compared with the constitutional inability to react to the outward circumstances, the condition is more easily cured. With a big constitutional factor and a slight trauma the treatment is more difficult.

2. But there are cases which present themselves in which only one impulse seems to be perverted, e.g., cases of fetichism (where the sexual instincts are aroused only by some object such as the hood of a perambulator). The rapid analysis of the immediate cause of these cases of arrest is often sufficient not only to remove the symptom but to liberate the normal sexual feelings towards the other sex which were in abeyance owing to arrest.

3. Nevertheless, there are cases in which one symptom seems to manifest itself in a patient otherwise healthy and lead one to expect to dismiss the symptom in a rapid analysis, whereas when one has dispelled one obstacle or repression, one finds that there are others underneath, which need to be got rid of (as we might peel the layers of an onion). The effect of this layer formation of repressions is often curious: with the bringing up of one repression we may dismiss the dominant symptom, but immediately another symptom manifests itself, a symptom from which the patient had not suffered perhaps for years. One is often said to 'produce' symptoms in treatment, whereas we are merely temporarily reviving old ones.

4. Again, when a symptom, perhaps of a very simple nature, like a twitching of the eye, is tracked down even to a definite trauma, it often refuses to subside, and we find that this symptom has led us to a very important defect

of character, such as a latent feeling of inferiority ; and we discover that we need to deal, not with a symptom and its immediate cause, but with the whole personality as dominated by one instinct and its emotion (the instinct of self-abasement). Thus an analysis may be elusive and deceptive, and may take much longer than was expected. It is this that has led some analysts to refuse to treat patients except those who are prepared for a long and thorough course of treatment. In any case the analyst will do well to make no definite promises of rapid cure.

Nevertheless, comparatively rapid cures may often be brought about, and we may give a general sketch of a method largely used in general analytic practice.

RAPID METHOD OF ANALYSIS SUGGESTED.—This method proceeds on the theory that neuroses are due to 'repression', and that cure is produced by the 'liberation of these repressions'.

We may gain access to the particular repression along two paths : (1) The symptom, physical or mental ; and (2) Dreams.

1. *The Symptom.*—It is found that the symptom is in some way connected with the repression, either because it happened to co-exist with the original emotional trauma, or symbolically. A lady has neuritis (organic) at the same time as a great mental conflict ; she seizes upon the neuritis as an excuse to deliver her from the responsibility of facing the conflict ; and the neuritis continues functionally as an expression of that repressed conflict. Starting with the symptom, we track it down to its source, not because there is any virtue in seeing what *once* occurred, but in order to discover what is the repressed emotion which *now* (as then) lies beneath the patient's neurosis. We thus discover the latent cause—that the symptom, say a pain in the back, was originally due to a morbid craving for sympathy, or a fetishism due to a craving for admiration. That it *was* originally so matters little ; that such a trait of character still governs the conduct of the patient and manifests itself in the symptom matters much ; and by the discovery of this trait in early life the patient comes to recognize a defect of character previously unrecognized by her.

But how does this discovery bring about cure ? By directing the patient's attention to the real problem, which is her craving for sympathy, or her desire for admiration, or her feeling of inferiority. Previously she had fought the symptom—without success ; now she faces the real disease, and in eradicating that cures the symptom also.

That analysis itself cures is a practical though not a theoretical statement of fact. The discovery of the truth does not itself cure, but it enables us to cure ourselves. The chief obstacle to cure is the ignorance of the cause. This is a principle of modern medicine, which emphasizes the need of correct diagnosis even more than of correct treatment, the latter being dependent upon the former. Theoretically, therefore, it is incorrect to say that analysis cures. Indeed, there are some patients of feeble intellect in whom analysis, even with suggestion, fails to cure because of the failure to adapt to new conditions. It is both wrong and dangerous to treat such by analysis. There are some people who literally cannot stand analysis, but they are few.

If, however, the problem is one of such severity—e.g., the repression of sex in an unmarried woman of strong sexual feeling—that the patient is unable to deal with it, then suggestion may be resorted to by the physician as a means of redirecting the emotion by reassociating it with ends other than those of reproduction—creative work, etc.

2. *The Dreams.*—When by tracing down the symptom one discovers the original repressed complex of which the symptom is the conscious manifesta-

tion and symbol, we may then pass to the patient's dreams; and in them we shall discover the same problem at work. The patient with a mother complex will dream of situations in which he is distressed and needing protection; the man with the inferiority complex will constantly find himself humiliated; the woman in the third month of pregnancy will dream at one time of her husband (the sexual relation) leaving her, and again of her husband killing her baby, clearly pointing to a conflict of the sexual and the maternal instincts in her. The symbols chosen by the dream will often be taken from the past, when circumstances occurred which reproduced the problem.

Such dreams are better analyzed, if possible, under hypnosis, where, owing to the fact that it is the 'unconscious' mind—that is, the mind which does the dreaming—that is operating and 'awake', we can obtain direct first-hand evidence of the conflict. Indeed, in hypnosis one may get the patients to dream, and they then produce dreams which they can immediately elucidate. "I dream I see two little ragged children, badly dressed, cold, and hungry, and lonely; they seem to be me; I feel like that with my husband, hungering for his love and lonely, but he is neurasthenic and cannot give me sexual satisfaction." The dream thus confirms the diagnosis already obtained by the exploration of the symptom, and convinces us that the recovery of the repression is not merely the recovery of an amnesia long since done with, but deals with a problem of the present. An amnesia is not necessarily a fact of the past; it is also amnesia of what is at present in the mind.

Results of Treatment: Shell-shock Cases.—One of the first questions that the general practitioner asks about the treatment by psychotherapy is, "Does it last?" War neuroses provide us with a favourable test in the comparative simplicity of the cases and the facilities afforded for judging the after-effects, in that related cases seek further treatment through the Pensions authorities.* We give the results of one such inquiry into the condition of former patients, made a year after their discharge. This inquiry was made from the patients themselves, and the questions asked were as definite as possible. It will be agreed that a 'neurasthenic' is not the man to give an exaggeratedly optimistic account of his own condition, especially when a pension is concerned. There was no selection of patients: they were the first 100 patients admitted, irrespective of the 'success' of the treatment in hospital. The results obtained a year after discharge were the following:—

Work.—Ninety per cent of these patients are now working. Of the remainder, 4 per cent are temporarily out of work, and 3 per cent are in hospital. Of the 90 per cent, practically all are working at their pre-war occupations. One exception is a miner who has to work as a bricklayer, and another a bricklayer who has to work on the ground. A third was a man who had a 'contused back' and could not walk, but is now a road maker; another, who had the spines of two vertebrae fractured and was lame in one leg, is now a postman.

Hours of Work.—The present average number of hours' work per day for all these patients (counting those in hospital as nil) is nearly 7 hours (6.9). Seventy-five per cent are working for 7 hours and over, which for practical purposes may be taken as a full day's work. The significance of these figures will be realized when we recall that practically all these men were, on admission, unfit even for regular sedentary work, and that practically all of them are working at their pre-war occupation and not at fancy trades.

* Inquiry from the Medical Research Committee was disappointing, owing to the difficulty they experienced in obtaining satisfactory data from the unsatisfactory returns received from the hospitals.

The Agency of Cure.—It may be said that these men have recovered 'in the course of time', and not as a result of treatment. It is important to decide whether 'time' or 'psychotherapy' is the best nurse. The patients were therefore asked : (1) Whether they are better or worse since they *left* hospital ; (2) Whether they are better or worse than when they *came in* to hospital. We thus have a comparison of the results of treatment *in hospital* and of their further recovery *in civil life*. The replies show that 93 per cent improved as a result of treatment in hospital, whereas only 40 per cent have continued to improve since leaving hospital in civil life.* These figures contradict three common assertions : (1) That psychotherapeutic treatment does no good and patients always relapse ; (2) That time alone is needed to cure ; (3) They also refute the charge, so often made in disparagement of 'shell-shock' patients, that they would "get better as soon as the war ended". For the most part these patients were treated during the war and in the early days of the armistice. To them recovery meant the possibility of being sent back to their unit, as indeed some of them were ; and continuance of sickness meant release from military service and a pension. Yet we find that they recovered more under these conditions (with hospital treatment) than under conditions of peace (without treatment).

Pension.—These conclusions are also borne out by the change in the pension. The average pension being received at the present time (counting those in hospital at 100 per cent) is 25 per cent. But this, it must be mentioned, includes the pension for all complaints, including the organic diseases, such as malaria, and wounds. About 40 per cent of patients had organic diseases accompanying the neuroses. For instance, one patient receives a pension of 40 per cent, but 20 per cent of this is due to mastoid disease. The comparison between the pension on discharge and at the present time can only be made in 30 per cent of cases ; but taking these, whereas on discharge the average pension was 21 per cent, it is now 80 per cent. Thus the tendency has been rather on the downward grade since discharge, though this does not amount to relapse.

After-treatment and Relapse.—Seven per cent of these patients have had to return to hospital during the year ; of these one was a sunstroke mental case (psychosis), and one an incipient dementia præcox ; but they are included in the inquiry as they were treated, not being certifiable. About 10 per cent of these patients (including those in hospital) have a pension of over 50 per cent ; these may be considered failures from the point of view of treatment. Further, about half have had to see a doctor within the year, possibly, though not certainly, for their war condition. These, therefore, cannot be considered to be absolutely cured ; but it must be remembered that the 'cure' aimed at was to restore in the soldier a condition in which he could carry on his work and earn his living, and in which his symptoms, if not entirely cured (which of course was the ideal), would not interfere with his enjoyment of life.† The average number of hours' work—seven—and the pension results, taken with the low percentage of the relapsed cases, indicates that the treatment did not altogether fail to achieve this result.

Psycho-analysis in Non-medical Practice.—Psycho-analysis has spread far beyond the limits of strict medical practice, and amongst many is assuming the form of a philosophy, a theory of life, even a religion. It must therefore

* Most of these patients were discharged to civil life, as the armistice occurred during their treatment.

† The methods employed in treatment were those described as "Hypno-analysis" by the present writer in *Functional Nerve Disease*.

be understood that psycho-analysis is merely a method of investigation, and not a constructive philosophy.

1. There is a tendency to impose on medical psychotherapy views of life that do not concern it directly. This does not mean that the medical man is immune from having a philosophy of life—that is inevitable, however unconscious he may be of it—but a special theory of life is not necessary for the application of psycho-analysis to medical practice. The essential difference between the method of investigation and the theory it professes to have discovered is amply illustrated by the emergence of various schools, especially the Viennese and the Swiss, both of which apply the method of psycho-analysis but arrive at quite distinct and at times contradictory views. The adoption of the ultimate view of either of these schools, it cannot be too clearly understood, is not essential in the practice of mental analysis, although we must always recognize the fact that it is to these schools we owe the development of the *methods* of psycho-analysis. The method of investigation is now a well-established psychological procedure, initiated and developed by these schools, the main feature of which is the exploration of unconscious motives; but the conclusions they draw, the one describing life in symbols of sex, and the other in mythical symbols, are not *necessary* inferences from their procedure. The confusion of the scientific with the philosophic methods in these systems has led to confusion of thought, and it is to be regretted that theories are so often set down in their literature as though they were statements of fact empirically proved by scientific investigation.

2. Accepting psycho-analysis as a method of psychological investigation, we must be prepared to see it applied to other branches of thought and activity than that of medicine. The year has therefore been characterized by the spread of psycho-analysis amongst the lay public, and applied to education, ethics, and criminology. The London County Council has established a course of lectures on psycho-analysis for teachers, delivered by a layman. In America there is a definite class of men and women known as clinical psychologists. The spread of knowledge of such utility as the laws of mental processes and the discovery of psycho-analysis and its relation to knowledge and conduct, cannot but be encouraged; but it is to be deplored that the reluctance of medical men even to investigate impartially the laws and operations of this science has induced laymen to apply the knowledge they have to the cure of diseases which should be the concern of the medical man alone: and it is to be further regretted that this tendency has received active encouragement from some psycho-analysts of repute. It is inevitable, however, that psycho-analysis as a method of scientific investigation should be applied by the clergy in dealing with ethical problems, and by teachers in the education of children, and must eventually be applied to many branches of knowledge—biology, ethics, education, even philosophy—as it has been to medicine; and the medical man must be prepared for this advance.

MEDICO-LEGAL CONSIDERATIONS. SHELL-SHOCK AND CRIME.

In several important cases of crime during the last year the plea of 'shell-shock' has been put forward in defence of a prisoner. It is easy to dismiss such a plea with a smile—and do great injustice to the victim of a disease (Taylor²⁸).

Crimes have been committed in fugue states, when the mind travels along two or more dissociated paths and is dominated by more than one theme, as in the fugue in music. Dr. Jekyll and Mr. Hyde have stepped out of the novel into life. Many cases of dual personality had, previously to the war, been

described by many writers—James, Morton Prince, Janet, and others—in which the person assumes another character. The cases of such dissociation which have resulted from the war are usually different: they are not cases of dual personality due to a change in the character of the person; the patient retains his personality but acts as though in different circumstances. One case tried in June of last year (1920) before the Lord Chief Justice may be cited, in which an ex-officer of good character committed a crime of which he was consciously quite ignorant. Whilst waiting for the trial he was treated, and, under hypnosis, the memory not only of the crime but of previous fugues was restored, in which he had, though in England, imagined himself back in France, and acted as though in such conditions. In one of these fugues he came within an ace of killing a man whom he took for a spy. On another occasion he committed the crime for which he was charged. The law has for many years recognized insanity as a plea for criminal innocence, but the only alternatives have been 'guilty' or 'insane'—if the act be admitted. The Lord Chief Justice referred to the necessity of revising the law in such cases as this. The prisoner's evidence of his own crime, as recovered under hypnosis, was admitted; and he was discharged in accordance with the verdict of the jury. The prisoner was also cured of his fugue states and depression by the recovery of war amnesias. The opening up of such cases in the courts of law is of course fraught with much difficulty, for such a plea will often be put forward if it be once admitted in law; but it makes it all the more urgent that medical opinion should be well informed, in the interests both of innocent prisoners and also of the innocent public!

REFERENCES.—¹*War Neuroses and Shell Shock*, 5; ²*Brit. Med. Jour.* 1920, Feb. 14; ³*Practitioner*, 1919, Nov., 362; ⁴*Social Psychology*, *passim*; ⁵*Jour. Amer. Med. Assoc.*, 1920, April 24, 1141; ⁶*Med. Press and Circ.* 1919, Oct. 22; ⁷*Jour. Amer. Med. Assoc.* 1920, April 24; ⁸*Lancet*, 1920, July 10; ⁹*Jour. Amer. Med. Assoc.* 1920, Jan. 10; ¹⁰*Glasgow Med. Jour.* 1920, Aug.; ¹¹*Lancet*, 1920, July 10; ¹²*N. Y. Med. Jour.* 1920, Jan. 10; ¹³*Jour. Amer. Med. Assoc.* 1919, Aug. 23; ¹⁴*Lancet*, 1919, Nov. 22; ¹⁵*Functional Nerve Disorder*; ¹⁶*Brit. Med. Jour.* 1920, March 20; ¹⁷*Lancet*, 1920, June 12; ¹⁸*Social Psychology*, 66; ¹⁹*Glasgow Med. Jour.*, 1920, Aug.; ²⁰*The Psychic Treatment of Nervous Disorders*; ²¹*Psychoneuroses and Psychotherapy*; ²²*Med. Press and Circ.* 1919, Dec. 3, 447; ²³*Ibid.*; ²⁴*Lancet*, 1920, Feb. 28; ²⁵*Ibid.*, 1920, June 12, 1296; ²⁶*Brit. Med. Jour.* 1920, Aug. 8; ²⁷*Med. Press and Circ.* 1920, June 23, 498; ²⁸*Lancet*, 1919, Nov. 1.

PUBLIC HEALTH ADMINISTRATION. (See also INDUSTRIAL HEALTH; INFECTIOUS DISEASES PREVENTION; MATERNITY AND CHILD WELFARE; SCHOOL MEDICAL SERVICE.)

Joseph Priestley, M.D., D.P.H.

Medico-legal cases.—*Medical Professional Secrecy.*—In the case of Garner v. Garner (Divorce Court), a medical witness claimed privilege on the ground that all information obtained in regard to any person treated under a Venereal Disease Treatment and Prevention Scheme, approved under the Public Health (Venereal Diseases) Regulations, 1916, Art. III (2), should be regarded as confidential. This view was over-ridden by the judge (Mr. Justice McCardie), who ruled that, in a court of justice, there were even higher considerations than those which prevailed with regard to the position of medical men and medical professional secrecy. The medical witness then gave his evidence, under oath. The view of the judge is correct, as there is no legal protection created by the Public Health (Venereal Diseases) Regulations nor by the various Public Health Acts under which such Regulations have been framed and issued—viz., the Public Health Acts, 1875 and 1896, and the Public Health (Prevention and Treatment of Disease) Act, 1913. The word 'privilege' is not used in the Regulations, as it would doubtlessly have been had such been the intention of the drafters; whilst the Acts themselves under which the Regulations

are made do not give any power to create a privilege in the proper sense of the word.

Ministry of Health.—The Ministry of Health is now forging ahead, having become established, as the result of the passing of the Ministry of Health Act, 1919, and as the outward expression of Parliamentary decision that the national health is of supreme and vital importance as the foundation of the well-being of the individual—physical, mental, and moral—and thus of the well-being of the nation. The first work of the new Ministry was organization—the co-ordination of all the resources of Public Health administration under one department, responsible for the health of the people *as a whole*. It is not intended that the Ministry of Health shall act as the local executive departments. Problems of local self-government still remain to be solved by the local sanitary authorities duly appointed to do so. In fact, the result of the inauguration of the Ministry of Health has been the enhancing of the status of the local executive sanitary authorities. Voluntary societies and agencies, and, last but not least, an enlightened and educated people, are also necessary, if the best results are to be obtained in public health. The medical practitioner also forms an important factor—the *practitioner* of the science of medicine. This inclusion of the medical practitioner in Public Health administration is due to the inclusion within the Ministry of Health of the National Health Insurance Commission.

Under the terms of the Ministry of Health Act, power was given to the Ministry to take over the duties of the Board of Education connected with the medical inspection and treatment of children and young persons, subject to an Order in Council being issued to that effect before the end of 1919. As an alternative procedure, however, power was given to the Ministry to allow the Board of Education to continue such work, subject to the supervision of the Ministry, and this alternative power has been exercised, with the result that the Ministry is responsible for deciding principles and lines of action in connection with the important subject of medical inspection and treatment of children and young persons, leaving to the Board of Education the executive administration. All communications, consequently, relating to medical inspection and treatment of school children must be addressed, as heretofore, to the Board of Education, Victoria and Albert Museum, London, S.W.7.

Preventive medicine, at last, is truly coming into its own, and the Ministry is preparing the way to becoming, in a sense, an imperial office, having, as one of its functions, international co-operation in health matters. Having regard to present-day developments of world-wide intercommunication, the growth of British overseas commerce, the progress of the knowledge of exotic diseases, etc., imperial and international hygiene must, of necessity, develop and become more generally acknowledged and valued. There can be no possible doubt as to the object that the Ministry has in view, and the *ideal* is a splendid one, as the coming years will show. The broad outlook taken by the central authority must re-act advantageously upon the many local health authorities throughout the country, and there must be a levelling up, in consequence, in all departments of administrative public health, with benefit to the health of the people. The Ministry of Health intends to be, not only in name but in fact, a statesmanlike department.

As Sir George Newman says in his first Annual Report (1919–1920) to the Ministry of Health, three things will be necessary to any great advancement in the national health: a comprehensive understanding of the purposes and scope of preventive medicine, steady and systematic administration of sanitary law and practice in each area, and an enlightened public opinion.

Ventilation as a Science.—The scientific basis of ventilation and open-air

treatment has been put forward and established by Dr. Leonard Hill on behalf of the Medical Research Council through the Department of Applied Physiology. Successful ventilation depends on the prevention of stagnation of body heat, and of uncomfortable chilling of the body. The greater the number of air changes, the less the danger of droplet infection. It is not the excess of CO_2 , lack of O, or the presence of organic impurities in the expired air that causes the discomfort and impaired health from overcrowding in ill-ventilated rooms, but rather a stagnant, moist, and hot condition of the air—a physical rather than a chemical cause. The cooling and evaporative powers of the air must be utilized to the full in all ventilation schemes, as they have a most important influence on health. The sun to warm the skin and the breezes to keep up a high rate of cooling are the scientific principles upon which open-air treatment is based. As evaporation proceeds, tissue fluids pass into the bloodstream, and with them various immunizing bodies or antibodies. Increased metabolism results from a higher rate of cooling induced by exposure to air-movements. Exclude the sun and wind from living-rooms, and the inmates fade. Pettenkofer's *permissible* limit of CO_2 must be relegated to a museum of archaic ideas. Purity of atmosphere is no longer to be gauged by its content of CO_2 or accompanying *pro rata* organic impurities.

PULMONARY ARTERY, EMBOLISM OF. (*See* EMBOLISM, PULMONARY.)

PURPURA ANNULARIS TELANGIECTODES (Majocchi).

E. Graham Little, M.D., F.R.C.P.

Weiss¹ reports two new cases of this rare condition, both in Russian immigrants, and exhibiting variations from the accepted description of this disease which negated, for MacKee—who saw the cases and has the widest experience of this particular affection of any observer in the States—their inclusion in this category. The reports must therefore be received with some doubt as to the proper classification of the two cases.

In the first patient, a man of 53, there were extensive follicular keratoses all over the body. On the lower third of the anterior surface of the left leg there was an irregularly circular patch, about 3 inches in diameter, mottled in appearance and predominatingly dark brown, containing an aggregation of discretely scattered or grouped dark-red to dark-brown spots, varying in size from a pin-point to a pin-head, which did not disappear on glass pressure. Some of them, on closer observation, showed a minute network of dilated capillaries. In putting the skin on the stretch there was a noticeable tendency for some of these spots to be arranged in circles and half-circles, and some coalesced to form irregular groups. In the centres of these circles and half-circles the skin was smooth and easily wrinkled, and when a fold was raised it was felt to be thinner than its surroundings. Some of these minute lesions were palpably raised above the surface of the surrounding skin. In the centre of this area was a scar marking the site of a biopsy. In this scar area were a number of slightly raised, pin-head to pin-point-sized, reddish elevations, the colour of which did not disappear on glass pressure, almost resembling the apple-jelly nodules of lupus, though smaller, less succulent, and somewhat redder in tone. The margin of the patch described above was not sharply circumscribed, but shaded off into the surrounding skin, extending down to and over the inner malleolus, less so over the external malleolus. Here were found minute reddish spots on normal, not inflamed or discoloured, skin; these spots did not disappear on pressure. Between the Achilles tendon and the internal malleolus the skin was discoloured in patches, yellowish, with a light-brown tone, containing numerous pin-point to pin-head sized spots which

by coalescence showed a tendency in places to slight configuration. Directly under the malleolus was a distinct annular lesion, composed of similar elements; on stretching the skin in this region, one could notice with a lens an extremely fine network of blood-vessels. Above this primary area, occupying the middle and lateral surfaces of the leg, there were innumerable reddish dots, extending to the patella and over it, and downward over both malleoli. Posteriorly, from the insertion of the Achilles tendon, extending over the calf and well up to the popliteal space and invading the whole circumference of the whole lower half of the thigh, there were also a number of patches composed of innumerable brown-red spots; some of them involuting with a change of colour to yellowish-brown, and with a tendency to circle and half-circle formation. These spots, in the area of yellowish discoloration, were not palpable, while the multitude of discrete puncta on the anterior surface were *palpable* as well as *visible*, and distinctly separated from the follicular keratosis mentioned before. A very similar eruption was noted on the lower part of the left thigh and on the lower third of the right leg.

The second case was a woman, age 43. On the anterior surfaces of both legs, involving the middle and lower thirds, the skin showed a yellowish discoloration with numerous minute, in places grouped, mostly discrete, reddish spots. The site of the original lesions showed only a yellowish discoloration. There was no brownish discoloration or any evidence of hæmorrhage whatsoever. The reddish spots did not disappear on pressure. The patient had noticed, for the last few months, a tendency to develop superficial veins on the upper half of the legs, but these caused no discomfort. The fact is worthy of record that the varicosities began some months after the onset of the lesions under consideration.

Treatment is not discussed.

REFERENCE.—¹*Arch. of Dermatol. and Syph.* 1920, May, 520.

PYELITIS AND PYELONEPHRITIS. The use of Mercurochrome 220 advised (p. 15); Vaccine (p. 22). (See also CHILDREN, DISORDERS OF THE URINARY SYSTEM IN.)

PYLORIC STENOSIS, CONGENITAL HYPERTROPHIC. (See STOMACH, SURGERY OF; X-RAY DIAGNOSIS, p. 26.)

RADIO-ACTIVITY AND ELECTROTHERAPEUTICS. (See p. 24.)

RADIOTHERAPY IN UTERINE DISORDERS. (See RADIOTHERAPY, p. 33; UTERUS.)

RAGWEED DERMATITIS. (See DERMATITIS.)

RANULA.

Sir W. I. de C. Wheeler, F.R.C.S.I.

This term has been loosely used in connection with a mucus-containing cyst in the mucous membrane on one side of the frænum of the tongue. Wharton's duct and the sublingual gland are usually superficial to the cyst, and the mylohyoid muscle lies underneath. The cyst has been variously described as arising from Wharton's duct, from the sublingual gland, from the mucous glands, and from an adventitious bursa. It is so anatomically constant, however, that there is probably only a single origin. Thompson¹ deals exhaustively with this subject. He believes that the cysts are congenital, and branchiogenetic in origin. They are, according to this authority, carried from a lower level to a higher by muscular agency in the rearrangement of the muscular planes of the neck. The cysts in the submaxillary and lingual regions are carried upward by the muscles of the tongue derived from the

hypoglossal group which belong to the seventh, eighth, and ninth body segments.

Lewis² thinks that ranulae arise from disease of the sublingual bursa alone; but many authorities are doubtful as to the existence of such a bursa. Skillern³ is convinced that so-called ranula is a hydrops of the sublingual bursa of Fleischmann. He found the condition in a case in which the sublingual and submaxillary salivary glands were removed fifteen months previously.

REFERENCES.—¹*Ann. of Surg.* 1920, Aug., 162; ²*Surg. Gynecol. and Obst.* 1920, July, 82; ³*Ibid.* 1919, Nov., 447.

RECTAL DISEASE, DIAGNOSIS OF. J. P. Lockhart-Mummery, F.R.C.S.

While there can be no doubt that during the last twenty years the diagnosis of rectal disease has very much improved, it is still an unfortunate fact that doctors are continually failing to detect diseases of the rectum during their early stages. There are several reasons for this, the most important being that the medical student is, with a very few exceptions, not taught how to examine the rectum or how to diagnose even the most simple maladies in this part of the body; and until proctology has become part of the medical curriculum, it is doubtful whether any serious advance in rectal diagnosis, except by specialists, is possible. Another reason is that doctors are averse to making a rectal examination, and think that their patients will object. In these days indiarubber finger cots can be obtained from any reliable chemist, and no practitioner should be without a box in his consulting-room. If they would only make a point of always examining the rectum in cases where a patient complains of any rectal symptoms, and refer the case to a specialist if anything of a doubtful nature were discovered, much would have been done to enable us to diagnose disease in its early stages and remove the reproach that over 50 per cent of cases of serious rectal disease are too seriously advanced for satisfactory treatment when first diagnosed. It is an undoubted fact that the vast majority of mistakes are due, not to ignorance on the part of the practitioner who first sees the case, but to his never having made an examination to see what is the matter. This shyness of a rectal examination should certainly cease.

An excellent paper has appeared by Charles J. Druick¹ on how to examine the rectum and interpret the findings. He points out how the symptoms may be interpreted, and goes very carefully into the question of the proper method of making the examination. A particular point is rightly made that the examination should not be confined to the rectum, but that the patient should be carefully examined for other lesions, more particularly in the genito-urinary tract. In discussing the question of digital exploration of the rectum, however, no mention is made of the value of bimanual examination. This is a most useful method of examining the pelvis which, while never neglected in gynaecological practice, seems frequently to be overlooked where the rectum is concerned. Another paper by Rawson Pennington² discusses the diagnosis of the more difficult cases of rectal disease. He particularly insists upon the importance of the sigmoidoscope in the routine examination of rectal cases and upon the valuable information which this may afford, and the importance of Wassermann tests and bacteriological examination of suspicious discharges. No mention, however, is made of the very valuable means of diagnosis afforded by a barium enema, watched through a fluorescent screen under the *x* rays. This is a method of diagnosis in obscure cases which has gained popularity.

A paper of considerable interest by Arthur A. Landsman³ deals with the history, in relation to diagnosis, of patients suffering from rectal disorders. While he does not suggest that the patient's history of his condition can be

used as a means of diagnosis apart from a thorough and systematic examination, he points out the value of carefully going into the patient's past history, particularly with regard to the question of prognosis and the line of treatment which has to be adopted. In this relation he quotes a case which is of sufficient interest to mention in detail. A man, age 33, presented himself for advice because of an occasional bleeding from the rectum. He was anxious to marry, and wanted to be given a clean bill of health. His habits, and personal and past history were good, his blood examination was negative, and he considered himself in normal health, though somewhat uneasy on account of the bleeding. The sigmoidoscopic examination revealed a few projecting teatlike bodies attached to the lower rectal wall, which upon microscopic examination were found to be benign polypi. In going over his family history, the fact was brought out that a brother and sister who had suffered from a similar trouble had died at an early age of carcinoma of the rectum. He was thereupon placed under observation, and within the next two years myriads of similar growths developed in the colon and the rectum, which bled profusely with every stool. The patient lost considerably in weight, and died of carcinoma of the colon at the age of 35. The importance of simple adenomata of the rectum and colon as a predisposing cause of carcinoma of the rectum is constantly being brought home to proctologists, and such cases as this show the importance of an early diagnosis.

REFERENCES.—¹N. Y. *Med. Jour.* 1919, Aug. 30, 363; ²*Jour. Amer. Med. Assoc.* 1919, Sept. 27, 966; ³N. Y. *Med. Jour.* 1920, Jan. 27, 100.

RECTUM, CANCER OF.

J. P. Lockhart-Mummery, F.R.C.S.

A number of interesting papers on this subject have appeared during the year, and a number of statistics brought forward which it may be useful to summarize.

G. W. Crile¹ finds that the general cause of death after operation for cancer of the rectum is due to infection, and he insists upon the importance of a preliminary colostomy, and that the incision should be made large enough to enable the liver to be examined for secondary deposits, and search to be made for secondary glands. The major operation is not performed for at least a week after the preliminary colostomy. His paper is based on the study of 72 cases of operation for cancer of the rectum, and the mortality-rate worked out at 9.7 per cent. His last series of 20 radical operations were unattended by any deaths. He believes in a preliminary colostomy in all cases, whether it is proposed to anastomose the sigmoid to the rectum after operation, or not. In the discussion which followed Crile's paper, William Mayo said that it was generally advisable to leave the patient with a permanent colostomy opening, and, in order to prevent the danger of recurrence, to remove the entire rectum.

Neil J. MacLean² reviews the subject of cancer of the rectum and pelvic colon. He points out: (1) That there is always a time in the course of every cancer when it is entirely a local disease, and, if accessible, can be completely removed. We do not know how long this time may be in the human subject, but those who have made experiments on mice place it at thirty-three days. (2) That cancer of the rectum is accessible, and, theoretically at least, could be cured in nearly every case, if operated upon at the right time. (3) That the public should be constantly and persistently taught regarding the symptoms that suggest cancer, and advised to seek early medical advice. In this way many cases that to-day are drifting on into a hopeless condition will be seen and treated before the advantage of time is lost.

P. Bull³ analyzes 71 cases occurring in the period between 1897 and 1918,

Of these, 44, or 62 per cent, were submitted to radical operation. The operation mortality was 11.4 per cent, and of the 39 cases which survived the operation, 12 were alive three years later. The 5 deaths occurring from operation were due to heart failure (1), sepsis (3), and pulmonary embolism (1). He found the greatest mortality was among the cases of resection.

P. Lockhart-Mummery⁴ describes a new technique for excision of the rectum. The method is accompanied by a preliminary permanent colostomy. The general points are: (1) The anus is sealed up before the operating field is prepared, and at no time during the operation is the bowel mucosa exposed; (2) The freeing of the rectum in front is done from the perineum upwards; (3) The peritoneum is opened from the front of the rectum when reached; (4) The bowel is divided with a cautery between clamps, and the end invaginated; (5) The wound is closed without drainage. During the four years 1914-1918 this method was used in 65 cases, of which 37 were in hospital and 28 in private. Five deaths occurred among the hospital cases, and no deaths among the 28 private cases. The total mortality was 5 deaths in 65 cases. It is interesting to note that the last 24 cases all recovered.

For the value of Radiotherapy in rectal cancer, see p. 33.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1920, July 31, 286; ²*Canad. Med. Quart.* 1919, Dec., 433; ³*Norsk Mag. f. Læge.* 1919, lxxx, 1233; ⁴*Lancet*, 1920, Jan. 3.

RECTUM, FOREIGN BODIES IN.

J. P. Lockhart-Mummery, F.R.C.S.

Edward A. Diggins¹ recalls the case of a marine engineer with a glass tumbler in his rectum. The base of the tumbler was upwards, and in his own attempts to remove it he had fractured the edge all round with a pair of thumb forceps. On examination, the base of the glass was found to be 9 in. up the rectum. The method of removal was as follows: Pieces of gauze bandage dipped in plaster-of-Paris were inserted with dressing forceps through a speculum until the glass was packed over-full. The last strip was sufficiently long to act as a handle for traction. After half an hour had been allowed to elapse to enable the plaster to harden, the glass was drawn out of the rectum with comparative ease, without any bleeding. The glass turned out to be an ordinary 5-oz. tumbler. The patient was allowed to return to duty next day, and there were no after-complications.

At a meeting of the Subsection of Proctology at the Royal Society of Medicine on Nov. 10, 1920, Mr. Ivor Back showed a patient from whom he had removed an inkpot, the base of which was 3½ in. in diameter. In the original attempts to remove the foreign body the inkpot had been smashed, and eventually it was removed in pieces with considerable difficulty. The rectum was badly lacerated, and the patient had two secondary hæmorrhages. He made a good recovery. In discussing this case, it was pointed out by Sir Anthony Bowlby that the best procedure was probably to open the abdomen at once, and push the foreign body out by squeezing the bowel from above, rather than to make attempts to remove it from below, which frequently resulted in serious injury to the rectum.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1919, Dec. 13, 1842.

RECTUM, STRICTURE OF (NON-MALIGNANT).

J. P. Lockhart-Mummery, F.R.C.S.

ETIOLOGY.—The commonest cause of simple stricture of the rectum is stated in almost all text-books to be syphilis. Of late years this view has been denied by all modern proctologists, and it is now generally agreed that by far the commonest cause is chronic sepsis; indeed, many proctologists now maintain that syphilis is an exceedingly rare cause. In the entire records of St. Mark's

Hospital for Diseases of the Rectum there are only two undoubted cases of syphilitic stricture of the rectum, so that at any rate in England it would appear to be a very rare etiological factor. On the other hand, it is generally agreed among surgeons who have practised among the negro population of America, and among natives in India, that syphilitic stricture among these races is common.

A very good paper is contributed by Frank C. Yeomans,¹ who discusses the various causes of stricture, and gives it as his opinion that while septic infection is a common cause, the commonest is tertiary syphilis. His foundation for this belief is that a Wassermann test was positive in 86 per cent. It does not, however, follow that because a patient gives a positive Wassermann the stricture must necessarily be due to syphilis. He points out that many cases of stricture of the rectum might be prevented by proper treatment during the ulcerative stage, but that treatment is usually neglected, and that dilatation during this period will help to prevent recurrence of the stricture.

TREATMENT.—This is discussed by Yeomans under the headings of proctotomy, colostomy, and excision. He favours external proctotomy, by which is meant complete division of the strictured sphincter and all structures to the tip of the coccyx. While he considers that external proctotomy gives immediate relief, it is not suggested that it cures the stricture in most cases, and he considers a colostomy generally becomes necessary. Excision, he claims, is the ideal treatment, and it should be performed either as a primary operation, or secondary to colostomy after active infection has subsided. He quotes 50 cases, in 94 per cent of which the stricture was within 10 cm. of the anus. No mention is made of the excellent method of treating stricture by internal proctotomy. For some years now, internal proctotomy has been used at St. Mark's Hospital in the treatment of simple stricture with excellent results. The operation is much less drastic than external proctotomy, and provided the dilatation is properly kept up for at least a year after the operation, the results are excellent. There is no large wound to heal, and the patient is not confined to bed for more than ten days or a fortnight. In the old pre-antiseptic days this operation was discarded on account of its danger, as was also the operation of internal urethrotomy; but with proper antiseptic precautions they both have now become safe procedures.

A new method of operating upon simple stricture of the rectum is described by Harvey B. Stone.² It is recommended for tuberculous stricture occurring in the lower four inches of the bowel in multiparous women. Briefly, the operation consists in exposing the stricture by a longitudinal incision in the posterior vaginal wall, cutting away part of the scar tissue and transplanting flaps of the vaginal mucosa into the gap, and subsequently repairing the wound in the posterior vaginal wall.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, Dec. 13, 829; ²*Surg. Gynecol. and Obst.* 1920, June, 608.

RELAPSING FEVER. (See also TICK FEVER.)

Sir Leonard Rogers, M.D., F.R.S.

A. S. Fry¹ reports on an outbreak of relapsing fever in East Persia at Birjand, in which the Indian hospital personnel were most affected, mainly through lice, although bed-bugs were also implicated. The cases were verified microscopically, and a moderate degree of leucocytosis with increased percentage of large mononuclears was noted. Treatment by 0.6-grm. doses of Arsenobillon intramuscularly was very effective, a crisis occurring within twenty-four to thirty-six hours after the injection. C. Newcomb² reports the

occurrence of relapsing fever in northern Mesopotamia in a railway construction camp, which was spread by lice, and in which *Neosalvarsan* in 0.45-grm. doses intravenously gave most satisfactory results.

Arsphenamin advised (p. 4).

REFERENCES.—¹*Ind. Med. Gaz.* 1920, 2; ²*Ibid.* 208.

RENAL FUNCTIONAL EFFICIENCY TESTS. (See KIDNEY FUNCTION TESTS.)

RESPIRATORY FUNCTION, CLINICAL STUDIES OF. O. C. Gruner, M.D.

There are two kinds of cyanosis, the true and the false. The latter is applied to patients suffering from polycythæmia where the discoloration is not due to oxygen unsaturation. The oxygen content of the venous blood is sometimes greater than that found in normal persons. Some cases of heart disease are of this kind. The other form of cyanosis has been carefully studied by Lundsgaard,¹ who has found an abnormally high oxygen unsaturation of the blood in the peripheral capillaries. The threshold value of mean capillary oxygen unsaturation for the incidence of cyanosis is 6 or 7 per cent by volume, reckoned as the mean between venous and arterial unsaturation. The normal percentage is between 2 and 3.

A method of measuring dyspnoea has been worked out by Hunt and Dufton,² in order to arrive at a means of assessing disability. A bicycle ergometer is employed, and the amount of air breathed during and after exercise is recorded in a meter minute by minute. The respiration-rate is recorded at the same time, in order to find the depth of respiration. The best index of dyspnoea is obtained when the total figures during four minutes preceding exercise are compared with the total for the second to the fifth minutes after exercise. The standard ratio is 1.64.

Related to this study is an investigation of the methods of determining normal vital capacity (West³). In this work it appears that the closest clinical index to vital capacity is the body surface area.

The respiratory function is very conveniently studied by noting the time of voluntary apnoea, as shown by Binet and Bourgeois.⁴

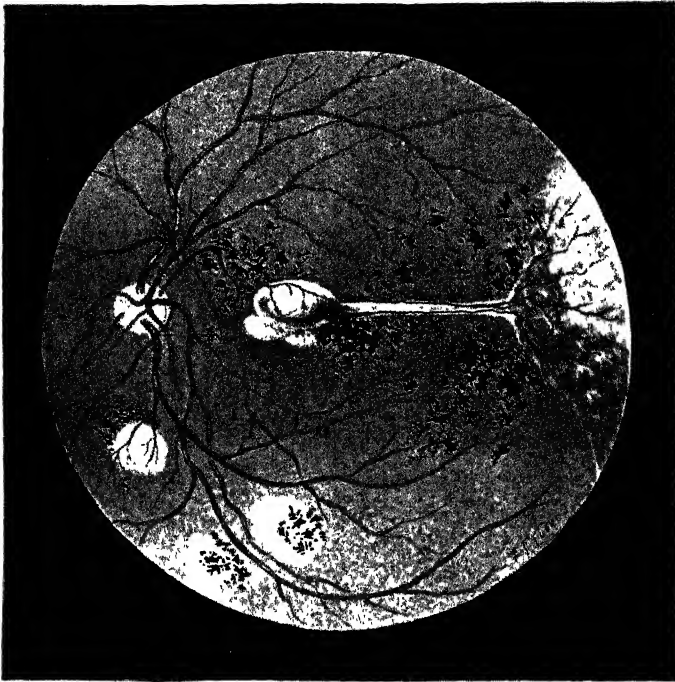
Barcroft⁵ has given a full account of what is now called 'anoxæmia' which will be read by those interested. This term means oxygen-want, and includes several types: there may be insufficient oxygen in the lungs (e.g., mountain-sickness); there may be too little oxygen-carrying capacity (anæmia); or there may be transport trouble, so that the tissues do not get enough. The chief features of the subject, which is of importance in regard to aviation, are contained in the accompanying table (Barcroft).

ANOXÆMIA.

1. Anoxic Type.	2. Anæmic Type.	3. Stagnant Type.
The pressure of oxygen in the blood is too low.	The quantity of functional hæmoglobin is too small.	The blood is normal, but is supplied to the tissues in insufficient quantities.
The hæmoglobin is not saturated to the normal extent.	The oxygen pressure is normal.	<i>Examples:</i> (a) Secondary result of histamine shock;
The blood is dark.	The blood is normal in colour.	(b) Hæmorrhage;
<i>Examples:</i> (a) Rare atmospheres; (b) Areas of lung partially unventilated; (c) Fluid or fibrin on surface of cells,	<i>Examples:</i> (a) Too little hæmoglobin; (b) CO hæmoglobin; (c) Methæmoglobin.	(c) Back pressure.

PLATE XXX.

CONGENITAL MULTILOCCULAR CYSTS OF THE RETINA



Congenital multilocular cysts in relation with the retina, and associated with quiescent pigmentary retino-choroiditis.

By kind permission of the 'Journal of the American Medical Association

Miller⁶ seeks to trace out the nerve path by which breathlessness is produced in various conditions. Diminished alkalinity of the blood, due to deficient oxygen-supply to the tissue and the rapid formation of lactic acid, accounts for the increased respiration-rate, and though usually indicative of renal deficiency, yet a primary disorder of the nervous system may explain a case. This form is detected by observing that the breathlessness ceases during rest and begins as soon as the erect posture is assumed. Adhesive pleurisy may set up this condition reflexly. In pneumonia it is the vagus which is affected rather than the centres.

REFERENCES.—¹*Jour. of Exper. Med.* 1919, Sept., 259, 271; ²*Quart. Jour. Med.* 1920, Jan., 165; ³*Arch. of Internal Med.* 1920, March, 306; ⁴*Presse méd.* 1920, June 12, 381; ⁵*Lancet*, 1920, ii, 485; ⁶*N. Y. Med. Jour.* 1920, March 6, 416.

RETINA, DISEASES OF

J. Burdon-Cooper, M.D., D.O.

Family Degeneration of the Macula Lutea.—This case, reported by Blue,¹ of Chicago, is one of the several cases of macular degeneration recently reported in American literature, and around which a good deal of interest centres on account of their classification. They are of the type originally described by Batten. Nine families suffering from this affection have now been reported, totalling about twenty-six individuals. The disease is one of unknown etiology, attacking several members of a single childship, the parent commonly showing no abnormality. It is unusual for it to affect more than one generation. Neither race nor sex has any influence. The disease is bilateral, and shows itself between the ages of 7 and 35, 10 to 14 being the commonest age. It is slowly progressive after a rather rapid onset, evidenced by central vision quickly failing; subsequently this failure becomes slower, and after reaching a certain degree may remain stationary for years. There is a central scotoma, with no peripheral-field restriction; pupils react to light and accommodation, the reaction being more sluggish when light is thrown on the macula directly; temporary pallor of the disc is occasionally observed; and the scotoma, which at first is relative, ultimately becomes absolute. In Blue's case there was no consanguinity, and the mentality was normal. Father and daughter were affected, the onset in the former being at 35 and in the latter at 12 years of age; in each of them both eyes were affected. There was a relative scotoma for green and red, the peripheral fields being normal, and both showed macular lesions. Syphilis occurred in the parents in Batten's original case; but in none of the cases reported by Stargardt, Jennings, Lutz, Darier, and Pusey was there any syphilitic taint. They all present features very similar, and it is difficult to resist the conclusion that they are one and the same disease, and that there is a definite familial macular degeneration which must be classified in a separate category to the amaurotic family idiocy and cerebral degeneration associated with macular lesions.

Embolism of the Central Artery.—Strebel² reports a case of cure in less than a month, the field becoming normal and the scotoma disappearing by paracentesis and massage. There are only fifteen such cases on record. Retinal embolism is often the precursor of cerebral hæmorrhage.

Regeneration of the Retina.—Munoz³ declares that regeneration of the retina is now an established fact, but such regeneration is impotent to restore the vitality of the membrane, on account of its being hampered by the medium in which it has to develop.

Congenital Multilocular Cysts of the Retina.—The accompanying Plate XXX illustrates a case brought before the American Medical Association in June, 1920, by G. E. de Schweinitz and M. Wiener.⁴ The appearance occurred

in a left eye, where it has existed since childhood, the right eye being normal in every respect. In the macular region is seen a large white atrophic spot, a little larger than the disc; protruding from the upper part of this was a large cyst formation, seen best with a +4.5 sph., and covered with small vessels. From the cyst extended temporally a narrow transparent tube carrying two atrophic vessels, terminating in a wide-spreading cystic mass, conical in shape with base outwards, its surface showing numerous small cysts or vesicles and atrophic vessels. The middle and lower fields of the fundus showed retinal pigment deposits, while a few atrophic spots were present below the disc.

The interest of the case lies in accounting for its occurrence. Cyst and cystic spaces in the retina may result from previous edema and degeneration; Iwanoff's cysts, found behind the ora serrata in enucleated eyes, are examples of this. Cysts form in association with separation of the retina of long standing, in congenital microphthalmos (Gunn's case), and in that type developing between the two nuclear layers of the retina (Collins' case). Cysts are associated with anomalies of the hyaloid artery. It is possible that the small balloon-like cyst in this case is the excentric vestigial hyaloid vessel, with a bulbous expansion at its origin, bent over and twisted away from the approach of the posterior surface of the lens to be fastened as shown in the figure. Choroiditis is not incompatible with this explanation. The authors prefer to explain it as due to intra-uterine hæmorrhagic retinchoroiditis, with cystic changes occurring in the secondary exudative processes. The large peripheral mass almost certainly represents exudation. It may be that the condition is an example of exudative retinitis, as described by Coats, with cystic surface changes.

Detachment of the Retina.—Verhoeff,⁵ after simple scleral puncture and firm ocular pressure, punctures both sclera and retina by an electrolysis needle. At the site of each puncture the retina becomes fused with the choroid. It is necessary that the retina should first be replaced. About fifteen punctures are made, the needle remaining in five seconds for each, and not protruding into the vitreous more than one millimetre. The method may be used as a prophylactic measure in cases of threatened detachment.

The pathogenesis of spontaneous or so-called idiopathic detachment of the retina has been the subject of many investigations, the most recent being contained in a report presented to the French Ophthalmological Society in May, 1919, by Gunn,⁶ of Lausanne. The views in the discussion on the pathogenesis and pathological anatomy of retinal detachment recognize three pathological conditions as chief causal agents—distention of the globe (myopia and hydrophthalmos), traction on the retina from within, and subretinal exudation. The first affects more the relation between the vitreous and the retina than the retina itself; it induces nutritional changes in the uveal tract, which predispose to detachment. Traction is the determining factor in idiopathic detachment. The order is: changes in the uveal tract, alterations in the vitreous, and traction; spontaneous detachment, therefore, cannot be regarded as affecting the retina alone. Exudation as a causal agent is derived from the choroid or by serous effusion from the retina, as in the retinitis of albuminuria. No real progress in treatment is possible apart from an accurate pathogenesis of each case. A thorough clinical examination is essential.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, Nov. 1, 1328; ²*Cor.-Blatt. f. schweiz. Aerzte*, 1919, Oct. 2, 1502; ³*Progresos de la Clínica*, Madrid, 1919, July, No. 79; ⁴*Jour. Amer. Med. Assoc.* 1919, Oct. 18, 1187; ⁵*Ophthalmol. Record*, 1917, January; ⁶French Ophthalmological Society Reports, 1919, May.

RHEUMATISM.

Injections of *Acidum Salicylicum* advised (*p.* 2); *Colloidal Sulphur* (*p.* 10).

RHEUMATOID ARTHRITIS.

Good results from large doses of Iodine (*p.* 14.)

RHINOPHYMA.

E. Graham Little, M.D., F.R.C.P.

This tends to be a familial disease occurring in seborrhœic patients, and commences with flushing of the face frequently repeated, with secondary chronic infection of the skin of the nose and sometimes of the cheek. There is vascular dilatation, connective-tissue formation, and cystic dilatation of the sebaceous glands. Alcohol seems to play an unimportant part in the causation. Seelig¹ thus describes the treatment he adopts: The most satisfactory procedure consists in shaving off the redundant tissue until the nose is brought back to what one assumes was its original form. In this shaving process, two things should be borne carefully in mind: (1) Do not shave too deeply; and (2) Preserve a thin rim of epithelium around the nares. If the shaving is carried too deeply, we remove all sebaceous-gland rests and leave no niduses of epithelium from which, as brood centres, epithelization may spread. This delays healing, and even if the nose be grafted, the resultant skin has a harsh, white, dry appearance so striking as always to command attention and cause comment. Furthermore, deep shaving may injure the nasal cartilages and set up a stubborn perichondritis. If a thin ring of intact skin is not left around the nares, serious disfigurement may result from the contractions incident to cicatrization. Hæmorrhage, which is usually very free, is checked with comparative ease by simple gauze pressure, and the patient is sent to bed with a large, well-vaselined gauze pad over his nose. The next day this pad is removed, and the denuded area is strapped with imbricated strips of sterile zinc-oxide adhesive plaster. This plaster dressing is changed daily.

Grattan² describes a case of very exaggerated hyperplasia of vessels and sebaceous glands of the tip of the nose, constituting a terminal tumour of large size and producing great disfigurement. This was removed by dissecting out, the skin covering it being reflected and restored. The surface was subsequently treated with applications of 50 per cent trichloracetic acid, and x-ray exposures at three-week intervals. The cosmetic result was admirable.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1920, April, 394; ²*Jour. Amer. Med. Assoc.* 1920, May 22, 1450.

RIBS, CERVICAL AND FIRST DORSAL. (*See CERVICAL AND FIRST DORSAL RIBS.*)

RICKETS. (*See DEFICIENCY DISEASES.*)

RINGWORM. (*See also SCHOOL MEDICAL SERVICE.*)

E. Graham Little, M.D., F.R.C.P.

Hartzell¹ reports two very unusual cases of ringworm, the first in a man, age 30, who had a widespread eruption of dark-red papules and nodules on the deltoid region and right half of the trunk. Areas which had involuted were left pigmented. There was severe itching, and consequently much pus infection and some scarring. The disease had probably lasted for about five years. The nails of the index, middle, and ring fingers of the right hand were diseased, and fungus was readily obtained from them and from the skin eruption, showing morphological characters of a trichophyton, but no cultural tests were made. The second case was in a man of 28, who showed a number of dark-red slightly pigmented oval and round patches on the crest of the left ilium, the pubis, the buttocks, the posterior surface of the thighs, and the left popliteal space. There were also many brownish-red nodules the size of shot,

with dark hard crust on the summit, distributed chiefly on the left thigh. The disease had lasted eight months and was extending. It had been diagnosed as syphilis by a specialist of repute. Fungus was readily demonstrated in scrapings, and cultures showed a decided pink coloration after twenty days, allowing of its classification with *Trichophyton rosaceum* of Sabouraud.

Elford² recommends the following simple treatment for ringworm of the scalp, and claims to cure cases in a month. As a preliminary step the affected area of the scalp must be shaved and cleansed with **Liquid Ethereal Soap**. The part is then gently and carefully rubbed with a piece of lint which has been dipped in **Liquor Potassæ** and dried with a piece of cotton-wool. Next the part is sprayed with **Ethyl Chloride** for about thirty seconds and allowed to dry; it is then painted with **Tinct. Iodi Mitis**. It is unnecessary to repeat the shaving and cleansing with ethereal soap, but the remainder of the procedure should be carried out morning and evening for the first three days and once daily during the subsequent four or five days. During this time a mild folliculitis occurs, and as a result the infected hairs fall out. Usually a week of such treatment is sufficient to effect a cure, after which it is only necessary to rub **Ammoniated Mercury Ointment** into the scalp twice daily, keeping the case under observation for about a fortnight or three weeks.

REFERENCES.—¹*Arch. of Dermatol. and Syph.* 1920, Jan., 1; ²*Brit. Med. Jour.* 1920, i, 867.

RODENT ULCER.

E. Graham Little, M.D., F.R.C.P.

Cleland and Paul¹ offer a valuable analysis of 60 cases of new growths, examined histologically, and record their opinion that the majority of these growths are of epiblastic, not endotheliomatous, origin. Four main classes are recognizable in this series: (1) Typical basal-cell epitheliomata derived usually from the pilo-sebaceous apparatus, comprising clinically and histologically typical rodent ulcers. (2) Atypical basal-cell epitheliomata derived from the basal-cell layer. They resemble very closely indeed the preceding class, the cells being usually larger, mitoses more frequent, and a concentric arrangement more evident, whilst the cell masses are irregular and ill-defined, usually without any definite marginal palisade layer. (3) Atypical squamous epitheliomata, comprising undoubted squamous epitheliomata, but showing appearances clearly indicating relationship with the rodent type in almost complete absence of cell nests. (4) Typical squamous epitheliomata. The 60 cases examined microscopically were comprised as follows: 34 typical basal-cell epitheliomata, 17 atypical basal-cell epitheliomata, 5 atypical squamous epitheliomata, 1 typical squamous epithelioma, and 3 anomalous growths, viz.: (a) An adenomatous type, probably derived from mouth glands in a patient with atypical basal-cell epithelioma elsewhere; (b) Melanoma, resembling a rodent growth in places, occurring on the sternum; (c) An anomalous growth of syringomatous nature. Very full histological data are given of the four types, but no comments are made as to treatment.

REFERENCE.—¹*Austral. Med. Jour.* 1920, May 1, 407.

SCABIES.

E. Graham Little, M.D., F.R.C.P.

Webb¹ recommends the use of a 4 per cent solution of **Copper Sulphate** applied to the whole skin after a bath with scrubbing.

Daubitz² recommends the use of the formula first prescribed by Ehlers and taken up by Milian, which was found of special service under war conditions. This formula is as follows: vaseline, lanolin, of each 250 grms., polysulphide of potassium, 50 grms., water 250 grms., zinc oxide 5 grms., petroleum 200 grms. This ointment is rubbed all over the body except the head, the patient

being previously simply washed with soap. The clothes are put on over the ointment, and a second inunction is made on the next day. On the third day the whole body is washed with soap, and the linen changed. If irritation is left after this treatment, a simple application of zinc ointment (oxide of zinc, lanolin, vaseline, equal parts) may be made.

Munro³ contributes some important personal investigations into the life history of the *Sarcoptes hominis*. Some of the new facts thus brought out are summarized below.

One female can lay 40 to 50 eggs. The adult parasite lives four to five weeks. The parasite is not, as is so often stated, especially nocturnal in its activities, the greater heat and restfulness of the victim in the night hours probably accounting for the increased activity at these times. Clothing may remain infective for at least eleven days. Eggs are easily destroyed by drying, and a certain degree of warmth and moisture are essential for both eggs and adults. Incubation periods vary according as to whether the infection is derived from the active parasite, in which event the time may be as short as six days (infection being regarded as established by burrow formation) or whether the infection is derived from egg-infected clothing, in which event the time may be as long as seventeen days. Eggs could be hatched experimentally in from 67 to 103 hours, according to degrees of temperature.

REFERENCES.—¹*Prescriber*, 1919, Oct., 167; ²*Arch. méd. Belges*, 1920, May, 393; ³*Jour. R.A.M.C.* 1919, July, 1.

SCARLET FEVER.

J. D. Rolleston, M.D.

BACTERIOLOGY.—R. Tunncliffe¹ found that the serum of sheep, immunized with hæmolytic streptococci from the throat in the acute stage of scarlet fever, contained opsonins and agglutinins for the hæmolytic streptococci present in the throat and early complications of the disease, but not for hæmolytic streptococci from other sources, such as erysipelas, mastoiditis, measles, influenza, diphtheria, and the normal throat. Absorption tests also indicated that the hæmolytic streptococci from scarlet fever formed a distinct group, scarlatinal streptococci removing the opsonins and agglutinins for these cocci, while absorption with a hæmolytic streptococcus from erysipelas had no such effect. Tunncliffe concludes that the hæmolytic streptococcus of scarlet fever forms a distinct group from the immunological point of view.

In a study of 25 strains of *Streptococcus hæmolyticus* isolated from the throats of scarlet-fever patients, W. Bliss² found that the great majority—viz., 20, or 80 per cent—belong to a specific biological type, as determined by the reaction of agglutination. He suggests that the heterogenous strains are accidental dwellers in the throat, and that a more careful selection of colonies may reveal a still higher proportion of unit type organisms.

SYMPTOMS.—The rarity of *malignant hæmorrhagic scarlet fever* is shown by Tron's³ statement that in the last fifteen years, during which 5000 cases of scarlet fever have been admitted to the Milan Hospital for Contagious Diseases, only 4 cases of this type have been seen at that hospital. The first occurred in a boy, age 15, who, on the sixteenth day of disease, developed copious hæmaturia and gingival hæmorrhages. He was treated with normal horse serum, and recovery took place after a long period of anæmia. The other three cases, which were all fatal, occurred in women from 19 to 33 years of age, and were characterized by the presence of petechiæ, hæmaturia, and metrorrhagia. Post mortem, subpleural, subepicardial, and subperitoneal hæmorrhages were found, as well as hæmorrhages in the submucous coat of the intestine and uterus. Hæmorrhagic scarlet fever is distinguished from hæmorrhagic small-pox by a history of exposure to other cases of scarlet

fever, a recent successful vaccination, and especially by the character of the onset and the temperature, which keeps high in scarlet fever, and falls in small-pox on appearance of the eruption.

Surgical Scarlet Fever.—Hutinel⁴ states that there have been 139 cases of scarlet fever in the surgical wards of the Children's Hospital at Paris during the last few years. It retards the healing of the operation wound, and almost invariably entails suppuration and a serious general condition. The results are especially disastrous when the scarlet fever develops after an operation for hare-lip or cleft palate, as the tissues become necrotic and a subsequent operation is rendered more difficult. Closed lesions such as fractures or tuberculous processes are not affected. To prevent the occurrence of plastic scarlet fever, the child should be isolated six or seven days before a plastic operation, and the isolation continued after the operation until the wound has healed.

Heart.—Brelet⁵ states that endocarditis is a rare complication of scarlet fever, in spite of the contrary opinion expressed by the older writers, who regarded it as frequent because they did not recognize the existence of extra-cardiac murmurs, which are very common in scarlet fever in children. As a rule it is mild and non-infective, although it rarely ends in complete recovery. In most cases a chronic valvular lesion is established. In the rare instances in which it is infective and ulcerative it may prove fatal. Pericarditis may occur alone or in association with endocarditis. It is usually latent, and generally subsides rapidly unless it is purulent, when it is almost always fatal. Functional disturbance of the myocardium, not necessarily accompanied by definite anatomical lesions, is much more frequent. In ordinary cases tachycardia is so frequent at the onset that it has some diagnostic value. In malignant cases it is extreme, the pulse-rate being 160, 180, or 200, and attended by a pronounced fall of blood-pressure. Bradycardia is fairly frequent in adolescents and adults at the end of the febrile stage, but very exceptional in children. Cardiac disturbance, consisting in dilatation and gallop rhythm, is an early and prominent symptom of scarlatinal nephritis, so that the clinical picture is one of cardiac rather than of renal disease. (See also HEART.)

The *respiratory complications* of scarlet fever are also discussed by Brelet, who states that involvement of the larynx may occur in the course of ulceromembranous angina. In some cases there is a slight hoarseness and some degree of laryngeal irritation, while in others the symptoms are more serious. Bronchopneumonia, which is often overlooked because it occupies a secondary place in the clinical picture, is not very common, especially in young children. In most cases it succeeds a severe infection in the upper respiratory tract such as suppurative rhinitis or infection of the nasopharynx. In rare cases lobar pneumonia may occur at the onset of scarlet fever, before or shortly after the appearance of the eruption. When it appears later, it is usually associated with nephritis or due to an intercurrent infection. Pleurisy in scarlet fever may be: (1) Infective or septicæmic; (2) Associated with endopericarditis and scarlatinal rheumatism; (3) Serofibrinous with effusion, occurring in convalescence. In the last case it is to be regarded, not as a complication, but as a tuberculous pleurisy the sequel of scarlet fever.

According to Canelli,⁶ who records a fatal case in a child, age 2, *appendicitis* is a rare complication of scarlet fever, only 15 cases having been recorded. In Canelli's case the symptoms of appendicitis appeared on the sixth day of a severe attack of scarlet fever complicated by endocarditis, and death took place without operation on the eleventh day. The autopsy showed an acute catarrhal inflammation of the appendix, from which a virulent streptococcus was cultivated.

DIAGNOSIS.—Paschen⁷ has employed the test introduced by Schultz and Charlton, which is carried out as follows: at the height of the eruption an intracutaneous injection is given of 1 c.c. of convalescent or normal human serum, and in positive cases an anæmic zone appears five to eight hours later, varying in size from that of a five-shilling-piece to the palm of the hand. This phenomenon does not occur if recent scarlatinal serum is used, or after injection of normal horse serum, diphtheria antitoxin, or saline solution, nor is it present in measles, mercurial rashes, or other scarlatiniform eruptions. Neumann⁸ points out that advantage may be taken of the fact that scarlet-fever serum in the acute stage does not cause the rash to fade, by injecting the serum of a suspected case in which the rash is ill-marked or faded into an undoubted case of scarlet fever with a well-developed rash. If the rash disappears, the doubtful case is not scarlet fever, whereas if the rash is not affected the diagnosis of scarlet fever is established. The value of the test, however, is diminished by the fact that injection of the serum of rubella patients also has no effect on the rash of scarlet fever. Moreover, the necessity of first performing a Wassermann reaction and testing the serum for sterility makes it doubtful whether the test will ever become widely applicable.

Loederich and Bory⁹ investigated the *Wassermann reaction* in 20 cases of scarlet fever at various stages of the disease with antigens of different degrees of sensitiveness. The results were as follows: With a very sensitive antigen the reaction was constantly positive during the first few days of the disease, and then became rapidly and progressively negative; whereas with antigens which were only moderately sensitive the reaction was almost always negative throughout. The character of the reaction showed no relation to the gravity of the disease or to the severity of any particular symptom.

TREATMENT.—Since 1911 Reiss¹⁰ has treated 182 cases of scarlet fever at the Frankfort Municipal Hospital with *Convalescents' Serum*, and 89 with *Normal Horse Serum*, the doses being 50 c.c. for children and 100 c.c. for adults. Apart from collapse, which occurred in a very few cases, and was easily remedied by ordinary stimulants, no bad effects were observed. On the other hand, Griesbach,¹¹ who employed this method in 21 cases, found that though in the majority of cases the results were satisfactory, severe complications, such as rigors and fatal collapse, might occur.

In *scarlatinal nephritis* Stransky¹² allows nothing the first day except a little water in spoonfuls occasionally. The second, third, and fourth day he gives two or three pints of 'malt coffee' with abundance of sugar. The child thus gets over 100 grms. of sugar daily. Then 500 c.c. of water are given fasting; if it is all eliminated in from two to four hours, more water is allowed. The food is then increased, but kept salt-poor and albumin-poor—e.g. potatoes with fat or butter, gruel, and biscuits.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1920, i, 1386; ²*Johns Hop. Hosp. Bull.* 1920, 173; ³*Riv. di Clin. Ped.* 1920, 405; ⁴*Jour. Amer. Med. Assoc.* 1920, i, 1607; ⁵*Med. Science*, 1920, ii, 516; ⁶*Ibid.* 517; ⁷*Ibid.* 520; ⁸*Ibid.*; ⁹*Ibid.* 518; ¹⁰*Ibid.* 521; ¹¹*Ibid.*; ¹²*Jour. Amer. Med. Assoc.* 1920, ii, 211.

SCHOOL MEDICAL SERVICE.

Joseph Priestley, M.D., D.P.H.

Ringworm in Schools.—Experience of ringworm as a school disease is increasing, as the result of school medical inspections, with the consequence that official views are changing as to the contagiousness of the disease. It is now agreed that there are, in large schools, numerous brief and almost negligible cases which come and go and appear to leave no trace behind. Such, at least, is the latest report of the School Medical Officer of the Staffordshire County Council, an area containing over 80,000 school children, of whom about 5 per 1000 (0.5 per cent) examined were found on the day of inspection to have

ringworm of the scalp. The *average* duration of the disease in Staffordshire children is nine months, so that there must be 6.6 cases per 1000 occurring annually—i.e., with a roll of 83,500 children, 550 cases of ringworm of the scalp per annum. This incidence is small, about the same as the incidence of tuberculosis (all forms), about half the incidence of otorrhœa cases, and about one-fiftieth of the cases of verminous heads. It will be noted that the above figures represent ringworm of the scalp. If cases of face and body ringworm are included, the above figures must be increased by (about) 50 per cent. Ringworm has a tendency to spontaneous recovery, and, in its common variety (*Microsporon*), is a disease practically unknown after puberty, being a disease of young school life (declining rapidly with age). Girls appear to suffer less than boys—a discrepancy that may be apparent only, and not real, due to slight cases escaping notice on account of long hair at present worn by girls, or due to the plaiting of the hair as carried out amongst girls. The infectivity of the disease is low, very close contact being necessary for its spread, which is greater, consequently, amongst children in the same house or even in the same street than amongst children sitting in the same class. The epidemicity of the disease is also low—single cases or small groups being the rule.

TREATMENT.—The fungus and spores of ringworm are easily killed when got at, but unfortunately they bury themselves in the deep hair-follicles, rendering epilation necessary. The new X-ray Treatment effects this epilation, but there are drawbacks, e.g., temporary (or even, at times, permanent) baldness, length of duration of treatment (about two months), and (?) danger of damage to the delicate brain-cells. The cost, too, of the *x*-ray treatment is considerable, as are also the practical difficulties of transit of children to and from institutions or hospitals where *x*-ray treatment is available. Ordinary domestic or simple remedies are resorted to in the large majority of cases, e.g., White Precipitate Ointment, Iodine, Sulphur Ointment, Jeyes' or Carbolic or other Antiseptic or Disinfectant Ointments, or even ordinary Ink (a good remedy in practice, by the way). For scalp ringworm, school or class exclusion is not necessary, nor is the systematic or wholesale cutting off of girls' hair. Wearing of caps and bonnets appears to be all that is necessary—under careful supervision.

SCIATICA.

J. Ramsay Hunt, M.D.

Hemi-sensory Disturbances in Sciatica.—A. Reichart¹ reports the existence of slight hemi-sensory symptoms in 64 out of 95 cases of sciatica. There was slight diminution of touch, pain, and temperature sensibility on the side of the sciatic neuritis. Deep sensibility was not affected. The disturbance of superficial sensibility was slight, and was at times absent from the face or parts of the arm. In other words, in addition to being slight it was often only partial. Often it was only demonstrable on comparison with the sound side. In 10 cases there was present instead a slight degree of hyperæsthesia. In addition to these alterations of surface sensibility, tender points were also demonstrable over distant nerve-trunks on the same side—e.g., the brachial plexus, the trigeminus, and the great occipital nerve. In the interpretation of these slight sensory phenomena a neuritis in other nerve distributions is excluded, as well as hysteria.

The novel explanation is offered of a referred central pain. The painful afferent stimuli from the sciatic distribution are supposed to crowd in upon the sensorium and extend to neighbouring sensory centres. This produces the hemilateral irritation and slight paralytic manifestations, the overstimulation of the sensory cells producing in turn a diminished functional activity. The central disturbance is therefore functional and not organic.

[It is interesting to recall in this connection that a hemi-hypæsthesia has been noted in cases of Bell's palsy. This was true not only of the face but of the whole half of the body. There is also a physiological difference in the activity of perception on the two sides of the body in certain subjects. —J. R. H.]

Injections of *Acidum Salicylicum* advised (p. 2).

REFERENCE.—¹*Munch. med. Woch.* 1919, Aug. 8, 903.

SCLERODERMIA.

E. Graham Little, M.D., F.R.C.P.

Henderson¹ reports a remarkable case which ended fatally, and an autopsy was obtained. The patient was a woman, age 46, 4 ft. 9 in. in height, and weighing only 4 st. 8½ lb. The disease was of the diffuse type and nearly universal. The inhibition of movement resulting from the tightened skin over the joints was a notable feature. There was very advanced muscular atrophy. The teeth were carious, and pyorrhoea was well marked. Towards the end the skin over the clavicles broke down, and a raw area involving the neck and upper part of the chest resulted. Emaciation became extreme, the patient weighing only 3 st. 12 lb. a fortnight before death. The autopsy showed a healed tuberculous focus in the right lung, and an acute tuberculous bronchopneumonia of the left. The thyroid and parathyroids were normal.

Weidman² discusses the classification and relations of three diseases, œdema neonatorum, sclerema neonatorum, and scleroderma, and reports a case of what he regards as the latter disease occurring in a new-born infant, the clinical features of which suggested the label sclerema; but the histological investigation led him to regard it as scleroderma, and he expresses the opinion that many cases of clinical sclerema are in reality scleroderma. The latter condition he regards as "a group lesion of variable etiology", and marked by a fibrosis of the skin, just as arteriosclerosis is a fibrosis of the arteries. He considers that in the case mentioned sclerema could be ruled out by the absence of changes in the epidermis and corium, for the fibrosis in his case only commenced in the fatty layer. The general post-mortem showed a marked fibrosis of the pancreas, liver, muscle, fat, and lungs. Syphilis was naturally suggested as a possible explanation, and could not be excluded. A very full post-mortem record of the case is contributed.

Paraffin-wax Baths found of benefit in treatment (p. 16).

REFERENCES.—¹*Glasgow Med. Jour.* 1920, April, 160; ²*Arch. of Dermatol. and Syph.* 1920, April, 375.

SCLEROSIS, MULTIPLE.

J. Ramsay Hunt, M.D.

ETIOLOGY.—The cause of disseminated sclerosis is unknown. Of late years the consensus of opinion has tended more and more toward regarding it as an inflammatory process of infective origin. This view in many ways harmonizes with the pathological findings, clinical course, and symptomatology. In 1917 Kuhn and Steiner succeeded in demonstrating the presence of spirochætes in guinea-pigs after their inoculation with the blood and cerebrospinal fluid of patients suffering from multiple sclerosis. In several of the animals motor disturbance in the limbs developed a few days after the intraperitoneal injections. Siemerling, in 1918, recorded the presence of spirochætes, under the ultramicroscope, in the brains of patients with the disease.

During 1920, Marinesco¹ injected the cerebrospinal fluid of two patients into six guinea-pigs, using the intracerebral, intraspinal, and intraperitoneal routes in different animals. The two animals injected intracerebrally showed a few days later paresis of the hind limbs. Their cerebrospinal fluid, obtained from the fourth ventricle, contained numerous spirochætes, corresponding to

those described by Kuhn and Steiner. Roux, who saw these organisms, agreed that they were specific and differed from the *Treponoma pallidum* of syphilis. Subsequent inoculation of fresh guinea-pigs from the same patients gave negative results, which Marinesco ascribes to the more advanced and probably less infective stage of the disease.

In conclusion, it is claimed that these observations indicate the existence of a specific virus, a spirochæte, in disseminated sclerosis, which is the cause of the disease in man, and which can be transmitted to animals, in whom it produces paralytic phenomena.

REFERENCE.—*Revue neurol.* 1919, vi, 481 (abstr. in *Med. Science*, 1920, Feb., 517).

SCURVY. (See DEFICIENCY DISEASES.)

SEA-SICKNESS.

Herbert French, M.D., F.R.C.P.

The war afforded ample opportunity of testing various measures for the prevention of sea-sickness, amongst which we referred in the last volume to the beneficial effects of blocking both external auditory meatuses firmly and deeply with cotton-wool before the voyage on board ship is begun. Various proprietary remedies are well known to the laity as well as to the profession. Atropine is now advocated strongly by P. Cazamian,¹ of the French Navy. As a means of preventing sea-sickness, he injects $\frac{1}{10}$ gr. hypodermically on embarking, and this may be repeated for three successive days if the weather conditions are bad. If, on the other hand, the sea-sickness has already started, he gives up to $\frac{1}{10}$ gr. hypodermically, with rapid benefit in the great majority of cases, though he has found it desirable in certain instances to give a second dose of $\frac{1}{10}$ gr. between twelve and twenty-four hours after the first. If this method of treatment does give any relief at all, it would appear to be valuable in so many individuals that it seems a therapeutic measure well worth employing.

REFERENCE.—*Arch. de Méd. et de Pharm. nav.* 1919, cviii.

SEBORRHOEA.

E. Graham Little, M.D., F.R.C.P.

Cumston,¹ basing his opinion on the researches of Merz, recommends the application of **Precipitated Sulphur in a Soap Vehiele**, so as to obtain the necessary maceration of the hyperkeratotic skin, and thus allow of greater penetration of the drug. A combination of **Castile Soap** (*savon de Marseille*) with **Borax** should preferably be used, and the skin of the head scrubbed with a special scalp-brush, or, when the latter cannot be had, a child's narrow toothbrush can be used instead, care being taken to spread the hair apart in regular lines. By this energetic and rational technique, not only is the horny layer removed, but the follicles are freed from their horny cells and thus an opening to the deeper parts is obtained. When the entire scalp has been washed in this way it is rinsed with hot water—or, when the hair is blonde, with chamomile tea—until the scalp is perfectly clean, when it is dried. Immediately after drying, while the scalp is still a little damp, the sulphur lather is spread along the lines between the hair with a special brush. This friction with the brush makes the sulphur penetrate the follicles more easily. During the first four to eight weeks of treatment it is necessary to wash the scalp at least once a week and to apply the lather twice a week. The treatment should last for at least three months, after which one washing every fortnight and two frictions during the interval will suffice. Further reduction is out of the question if the results are to be maintained.

Instead of sulphur lather, **Sulphur Powder** may be used, or an alcoholic suspension. The powder is spread with a small cotton tampon and gentle

massage along the partings made between the hair; this should be done two evenings a week. Besides its chemical action, this powder has the advantage of rendering the hair light and elastic. As in the treatment with sulphur lather, lavage of the head should be done regularly once a week. If the alcoholic sulphur lotion is used, a 10 per cent solution is strong enough, the scalp being rubbed with the lotion three times a week, always along the partings in the hair. At the end of each week the sulphur deposit is removed with borax soap. In the treatment with the powder or alcoholic lotion, the lavage may be advantageously replaced by an **Egg Shampoo**—the yolk of two eggs, a soup-spoonful of olive oil, and the juice of half a lemon thoroughly mixed together. The scalp is shampooed with this mixture, which is allowed to remain for two hours before washing the scalp with hot water and soap.

If the seborrhœa is complicated with eczema, the lavages are contra-indicated at the beginning of the treatment, and first an antiseborrhœic ointment should be used until the eczema is cured, after which the treatment of the scalp is begun. Merz gives the following as an antiseborrhœic ointment:—

R	Acidi Carbolici	50 cgrms.	Balsami Peruviani	2.5-5 grms.
	Hydargyri Præcipitati		Vaselinum Album	ad 100 grms.
	Albi	2.5-5 grms.		
	M. Ft. unguentum.			

Ultra-violet Rays are a very useful adjuvant of the treatment. The quartz lamp is the best means of production, and in application to the scalp partings of the hair should be made along which the rays are to be applied. Redness and some tenderness result, but the action should not be pushed beyond these limits, and the face and neck should be protected during the sitting by black paper. It is impossible to give any instructions for more exact dosage, as the influence of the lamp varies so much. The raying should be performed twice weekly, and an average of twelve exposures should make an appreciable improvement.

REFERENCE.—¹*N.Y. Med. Jour.* 1920, Feb. 14, 238.

SERUM SICKNESS.

J. D. Rolleston, M.D.

A. D. McCallum¹ records a fatal case of anaphylaxis following prophylactic injection of diphtheria antitoxin. The patient was a boy, age 5, who collapsed and died five minutes after subcutaneous injection of 2000 units. Apart from susceptibility to bronchial colds in the winter, he had always enjoyed good health. His three younger sisters were injected with the same dose without any bad result. Post mortem, except for caseous glands in the mesentery, all the organs were healthy. The case bears a close resemblance to the one recently reported by G. H. Waugh (*see* MEDICAL ANNUAL, 1919, p. 385).

Proteal injection found useful in relapsing cases by Sweddell (*p.* 19).

REFERENCE.—¹*Brit. Med. Jour.* 1919, ii, 596.

SINUS THROMBOSIS. (*See* EAR DISEASE, INTRACRANIAL COMPLICATIONS OF.)

SKIN DISEASES, GENERAL. (*See also Spécial Headings.*)

E. Graham Little, M.D., F.R.C.P.

Skin Eruptions as an Index to General Disease.—Scholtz¹ essays to group some eruptions of the skin as they indicate general disease.

Syphilitic symptoms he describes thus: lesions of dusky-red, raw-ham, or copper colour, with sharply-defined borders, deep cutaneous and subcutaneous infiltration, tendency to form flat lesions, serpiginous, reniform, or circinate in shape; in the later stage tendency to ulcerate and to form soft, gradually

depigmented, wrinkled scars of a cigarette-paper variety. He deprecates too much reliance on the Wassermann test, which should be interpreted only in connection with the lesions, and clinical evidence should always take precedence of laboratory findings. He draws attention to the value of the less-known tuberculides in eliciting early evidence of tubercle.

Diabetes may often be first diagnosed by the dermatologist, who notes the dry lustreless skin, pruritus, local or general eczema of the genitals, recurring boils and carbuncles.

Erythema multiforme eruptions may be of special value in detecting systemic disease in young subjects. Three types of the erythema multiforme group are particularly often associated with constitutional symptoms of malaise, fever, and involvement of the joints; erythema multiforme of large papular type, erythema nodosum, and the purpuric type, which, according to the intensity of constitutional symptoms, is termed purpura rheumatica, purpura hæmorrhagica Werlhofii, and Henoch's purpura. The early recognition and correct interpretation of these lesions, when they precede visceral symptoms, can be of the greatest service in the prevention of further development of the rheumatic infection and its cardiac complications. This syndrome should be gravely regarded as a surface indication of deep streptococcal focal infection somewhere in the system, calling for a thorough search, and it should not be lightly dismissed, as is often done.

Leukæmic syndrome: Quite recently there has been introduced a leukæmic syndrome. It includes, besides bluish tumours which are true granulomata, persistent pruritus, prurigo-like rashes, bronze-like pigmentations, and purpuric lesions. The appearance and persistent development of these lesions without any definite etiological factor suggests a possibility of latent leukæmia or Hodgkin's disease, and calls for a blood examination.

The author gives a long list of 'precancerous dermatoses', in which he includes seborrhæic warts, senile and arsenical keratoses, Paget's disease, leucoplakia, and pigmented melanotic nævi. [With the exception of Paget's disease this condemnation would certainly seem to be unduly pessimistic, and few would agree with the advice to remove or destroy all these lesions as leading with any justifiable degree of frequency to malignancy.—E. G. L.]

Excessive and deficient secretion of thyroid may be revealed by skin conditions. The hypothyroid skin syndrome is manifested by thick, dry, pasty skin, suppression of perspiration, lustreless brittle hair, and alopecia. Many cases of dry chronic eczema, psoriasis, ichthyosis, and scleroderma have hypothyroidism as the underlying etiological factor, and they readily improve with the administration of thyroid. Hyperthyroidism, on the other hand, produces thin, perspiring, easily flushed skin, urticarial attacks, pigmentations, dystrophies of the nails, keratinization, and pruritus.

The relationship of other ductless glands and their internal secretions to skin disorders is not as definitely established; yet a number of clinical observations are recorded to substantiate such relationship. The association of pathological changes in the adrenal glands with the Addison bronze-like skin discoloration and purpuric rashes, as well as the successful treatment of some cases of vitiligo with an extract of suprarenal glands, is well known.

The Skin a Mirror to the System.—Under this curious title Engman² contributes a philosophical paper which will repay perusal. He claims that eczema in infancy points to a subsequent tendency to adenoids, asthma, enlarged glands, and bronchial affections. Xeroderma pigmentosum is an evidence of premature senility, even though it may occur in children of ten. In fact, it may be said that a man is as old as his skin. Keratoses, persistent freckles which do not disappear in winter, discolorations, pigmentations, wrinkling,

are all symptoms of wear and tear which may appear long before they are due. The development of so-called oily seborrhœa is as much a secondary sexual character as the growth of hair on pubes and chin.

Special attention is given to hypothyroidism, the symptoms attending which are summarized as follows:—

1. There may be a dryness and scurfiness of the skin, frequently associated with pruritus.

2. A shrivelled presenile appearance of the skin as a whole may exist, differing from other types of presenility in that the changes are more marked on the covered portions and on the palms and soles. The skin over the covered portions is more deeply lined, somewhat finely striated, of a very pale pearl-grey, dry, maybe scurfy, and soft. The palms and soles are characteristic, dry, maybe fissured, the lines of the fingers and palms greatly multiplied by deepening of the furrows. The skin of the dorsum of the foot is sometimes slightly atrophic.

3. There may be an erythema of a deep-red to purplish hue on the nose and cheeks, curving downward around the corner of the mouth on to the chin. This area may be studded with small, fine, scaly papules due to secondary infection. The face is full and round, and the cheeks are prominent.

4. Myxœdematous pads may be found in the supraclavicular depression. These are small, raised, tumour-like hemispheres, resilient to the touch. They may vary daily in size. Their peculiar resilience differentiates them from fat. Such pads may be found elsewhere on the individual, quite frequently on the arms, as occurred in a brother and sister in one series of cases. They can easily be discovered by careful palpation.

5. There may be loss of hair, particularly about the temples. The hair is dry and lustreless.

6. A sharply-defined seborrhœa-like dermatitis of the head, neck, face, and chest may be present. The process stops abruptly just below the clavicle in a curved line, curving convexly upward and backward from the front to join the area from behind at the base of the neck. This type of marked dermatitis the writer has seen disappear again and again under proper thyroid therapy. It is usually accompanied by patches in front of the elbows and behind the knees. Other symptoms of hypothyroidism are usually present: headache, slow pulse, forgetfulness, pain in the back, slight resistance to cold, etc.

7. Pigmentary anomalies are frequently the sign of thyroid disturbance as well as that of other glands, the suprarenal glands for instance. The thyroid pigmentations may be: in children, a slight deepening of pigment in a broad band about the neck, the deepening of colour sharply defined; a similar deepening to a light *café au lait* tint about the trunk, *en cuirasse*; a darkening of the whole skin to a deep pearly or dirty, unhealthy, bluish-grey, or a changing of the skin to a 'skimmed-milk' tint.

8. A scurfiness of the elbows and knees, when accompanied by the palmar and plantar changes, is characteristic of hypothyroidism in those past 30.

9. Acquired ichthyosis or ichthyotic-like changes appearing after puberty reflect thyroid deficiency.

The erythema group: This should always be taken as calling for systematic search for a focus of infection, which may be a diseased appendix, septic teeth, malignant endocarditis, etc. Lupus erythematosus the author regards as indicating tuberculous infection, a conclusion which is much disputed. Dermatitis herpetiformis he thinks is always a toxæmia, usually intestinal. The papulo-necrotic tuberculides are now accepted as affording valuable evidence of systemic tuberculous infection. Xanthoma, especially in the form of striæ, may be the first indication of diabetes.

Acidosis in Skin Diseases.—Sweitzer and Michelson,³ stimulated by a paper published by Barber and Semon (noted in the MEDICAL ANNUAL, 1919, p. 383), have examined the alkalinity of the blood (not of the urine) in a number of skin diseases, and have formed the opinion that acidosis is not present with any frequency in psoriasis, acne vulgaris, eczema, and seborrhœic eczema. Alkali therapy was unsuccessful in their hands, and they enter a warning against the promiscuous use of this medication.

Scarlatinoid Eruptions.—Scholtz⁴ brings a large body of evidence to show that the rash of scarlet fever is so variable and inconstant in its features that diagnosis on the rash alone is seldom possible, and even the concomitant symptoms which are regarded as corroborative of the disease are often absent, or are simulated by other conditions. Bell, in a recent contribution, presenting an analysis of 300 cases of scarlet fever, decisively refutes the classical and rigidly-drawn picture of scarlatin rash. His conclusions are: The face is rarely invaded—in fact, only in the most intense types of rash. The punctate erythema is merely an erythema with a goose-flesh on the top of it. Pastias's sign of accentuation of the rash in the normal folds of the body is missing in many cases. Rumpel Leeds' phenomenon, hæmorrhages at the elbow from the compression of the upper arm by means of a bandage, is present also in measles and other exanthemata. In the presence of angina, strawberry tongue, and erythema of the soft palate, the rash on the body need not be looked for to make a diagnosis and need not be present. Not even the strawberry tongue remains unchallenged as a distinctive and exclusive feature of scarlatin rash, and, according to Schamberg, it may occur also in scarlatinoid erythema. It follows from this consideration that the differentiation of dermatological rashes from the exanthems is especially difficult. It is a question whether there is any such entity as scarlatinoid erythema, which some authors regard as a clinical group. It is probably wiser to regard the condition as symptomatic of several diseases than as a disease *sui generis*. In the writer's opinion scarlatinoid erythema is not a nosological entity, but merely a generic term signifying a toxic erythema of systemic origin. Scarlet fever is a toxic erythema of a bacterial causation at present not identified, and therefore should come into the same generic group. The author makes the much less acceptable suggestion that the dermatological group erythema multiforme should be enlarged to embrace these rashes.

Affections of Mucosæ Associated with Skin Diseases.—Foerster⁵ reviews the skin diseases which may show lesions of the mucosa. *Lichen planus* may affect the mucosæ before the skin, when it is difficult to distinguish from syphilis. The essential lesion is a papule, appearing as a convex, conical or flattened, hard, whitish-grey dot of pin-head size or smaller, without an inflammatory halo. The papules are either discrete and scattered, or arranged in groups or lines, the latter often forming a rather characteristic meshwork, with nodes at the points of intersection. Circinate lesions occasionally develop by reason of the appearance of new papules at the margin of an older group, with involution of the latter, leaving a depressed, smooth, non-striated, bluish-red centre, surrounded by a delicate polycyclic border composed of tiny papules. The formation of ring lesions by central involution and peripheral extension of large papules has also been noted.

In *lupus erythematosus*, also, the mucosæ may be first affected; the disorder begins as a hyperæmic, bluish-red, slightly elevated spot, with indefinite outlines and, at times, a slightly eroded surface. In this stage differentiation from other acute inflammatory lesions is often impossible. Within a few days the lesion undergoes a change, the margins are slightly elevated and more distinct in outline, and delicate vascular striations are observed converging

toward the centre of the lesion, which is now depressed, eroded, and often covered with an adherent yellowish pellicle. In a later stage the central erosion increases in depth, and is either converted into a thin, flat scar, or is covered with epithelium, with the formation of closely-set, bluish-white puncta or striations converging centrally. On the lips the striæ may be arranged in parallel lines or in the form of a delicate network. Coincident with the appearance of these whitish striations, the lesion loses its inflammatory character and enters on the stage of atrophy and quiescence. It is not unusual, however, for the lesion again to enlarge by peripheral extension and to show recurrent central erosion at intervals. This description applies especially to patches as they appear on the buccal mucosa, which is the site of predilection.

Lesions of the mucosæ are frequent in *erythema multiforme* and in *pemphigus*, and—especially in the form of *pemphigus vegetans*—may closely simulate syphilis. In these diseases the lesions of mucous surfaces will almost invariably present evidence of their vesicular or bullous origin by shreds of epithelium which persist at some part of their margins, though careful examination may be required to reveal them. In addition, these lesions are usually painful, bleed readily, are always superficial and not infiltrated, are surrounded by an inflammatory zone, and may present polycyclic contours by fusion of adjoining lesions. The polycyclic outline and collarette of epithelial shreds are also features which serve to differentiate relapsing herpes of the mouth from mucous patches, as pointed out by Fournier.

Moeller's glossitis is a rare condition which is thus described: An affection of the tongue occurring in middle-aged adults, principally women, and affecting especially the tip and edges, but also the dorsum of the tongue; but at times also the inside of the lips, cheek, hard and soft palate, and characterized subjectively by a sensation of burning pain, and objectively by the presence of intensely red, sharply defined, irregular patches in which the filiform papillæ are thinned or absent, the fungiform papillæ are swollen, and the stratum corneum desquamated. The condition shows periods of exacerbation and lessened intensity, but is very resistant to treatment, and tends to persist. The severe pain caused by eating interferes with nutrition and may lead to grave consequences.

Vincent's disease has shown a notable increase in America following upon the return of American troops from Europe, and confusions with syphilitic affections of the mouth are not infrequent. Vincent's disease may appear on the tonsil as a deep ulceration; on the ramus of the lower jaw posterior to the last molar tooth as a localized ulcerating patch; as a general mouth infection involving almost the entire mucosa, pharynx, and at times the tongue, or remain limited to the gums, where it is often primary and may be mistaken for pyorrhœa alveolaris. Mild cases tending to chronicity occur as tonsillitis or gingivitis of moderate degree, or on the cheeks and lips in shred-like patches resembling the condition observed in those who habitually bite the lip or cheek. These mild types may develop into severe attacks, with the formation of sloughing, serpiginous ulcers covered with a heavy, pultaceous, creamy, often adherent pseudomembrane. The ulceration may be superficial, or it may be deep and destructive; it may spread with rapidity, and involve large areas of the mucosa. The breath is foetid, the glands are swollen, and the patient often presents a pallid or yellowish appearance, even in cases of moderate severity, though the systemic reaction is often less than would be expected. The spirillum of Vincent and the associated fusiform bacillus are recognized as the causative agents of the disease, and can be readily detected in smears.

Nocardiosis resembling sporotrichosis.—Guy⁸ reports a case of chronic ulcerations of the forearm, beginning as deep-seated nodules, in a man, age 50, in whom the diagnosis of sporotrichosis was made on clinical data, but sections of skin showed organisms, and cultures demonstrated growths which allowed of classification with *Nocardia*. Uninterrupted recovery of a long-standing disease followed on the administration of **Potassium Iodide**.

Acladiosis of Castellani.—Mendelson⁷ contributes an interesting case of chronic ulcerations in a Chinese coolie admitted into the Central Hospital, Bangkok, cultures from which on glucose agar showed typical features of the organism described by Castellani in 1916, and named by Pinoy *Acladium Castellani*. The ulcers, previously very intractable, yielded speedily to administration of large doses of mixed Iodides and daily local dressings.

Endomyces albicans infection.—Tanner and Feuer⁸ report a very interesting case of multiple miliary abscesses occurring on the finger and persisting for three years uncured. From the discharge a growth was obtained on glucose-agar plates, which was identified with *Endomyces albicans* (thrush fungus).

Botrytis infection.—Engman⁹ describes a case of fungoid disease of the vulva in a negress, which clinically was indistinguishable from a *Tinea* or *Epidermophyton* infection, but which grew a culture which was pronounced by a botanical expert to be probably a *Botrytis*. The condition was extremely rebellious to treatment, and remained uncured.

Sebaceous Gland Secretion.—Varney¹⁰ would ascribe to deficiency in the normal secretion of sebaceous matter, engendered by bad habits of civilization, many of the diseases of the skin most commonly met with. Too frequent removal of the natural oil by baths and soaping is to be deprecated. Lack of this oil produces a harsh dry skin which tends to fissure and promote pyoderma; it encourages a constant wasting of bodily heat, so that the subject feels the cold intensely, gets unrefreshing sleep, requires more food, and is prone to infections. In the subsequent discussion, Sutton recommends in such patients the application of an oily mixture which apparently originated with Pusey: powdered tragacanth 4 grms., phenol, glycerin, oil of bergamot, of each 5 min., olive oil 120 c.c., distilled water to 480 c.c.

Neurotic Excoriations of the Skin.—These are defined by MacKee as "traumatic lesions produced by a person without the intent to deceive". Some of these persons appear to possess normal nervous systems, most of them are more or less neurotic, and a few are hysterical. It is more common in males than females, and between the ages of 18 and 50. MacKee¹¹ thinks the beginning of the habit may be traced to the semi-unconscious desire to remove what the patient regards as a foreign body, such as a follicular plug, or small elevation of the skin. The author reports 14 cases—8 women and 6 men. The subjects are usually described as neurotic and uneducated, and the distinction is insisted on that there was no malingering, except in one instance. In the fourteenth case the histological examination unexpectedly disclosed a lichen planus as the cause of the excoriation, and MacKee gives the warning that this possibility must be kept in mind in this class of disease. Treatment consists in removing any cause for pruritus, if such exists, and in moral suasion, which may be much helped by application of x rays.

Pusey and Seneat¹² report in detail three very similar cases to those just described, and accept the same explanation as offered by MacKee.

Congenital Ectodermal Defect.—Under this title Goeckermann¹³ reports a very rare case of total congenital absence of pilosebaceous follicles and sudoriparous glands, absence of teeth in the upper jaw, and only rudimentary teeth in the lower jaw. The nails were present, but furrowed longitudinally. There was an atrophic rhinitis, the bridge of the nose was sunken, and the forehead

unusually prominent. The patient was a girl of 21, born in England, of mentality above the average. There was no history of similar conditions in the family, as has been reported in other instances of this rare disease. Syphilis was suggested in the father, but there was no direct evidence of this in the patient, and her blood was negative. As a consequence of complete absence of sweat apparatus in these patients, they usually suffer seriously from heat, and cannot sweat. Treatment is obviously hopeless.

Sarcoid Tuberculosis of the Skin.—Cumston¹⁴ says the essential features of this clinical type are the development insidiously and slowly, either in the substance of the skin or beneath it, of indolent nodules, varying in size from a pinhead to a pigeon egg, of hard consistence, and little or no tendency to suppurate or ulcerate. Three clinical groups of these tumours are distinguished.

1. The Boeck-Darier type, still called the *disseminated miliary lupoid type*, is an eruption of hemispheric blotches the size of from shot to that of a large pea, at first rose-coloured, later livid or brown, with a smooth surface or very slightly squamous, and semi-soft in consistency. By vitropressure their tissue is less translucent than that of a lipoma, and often appears to be composed of separate grains. The eruption is always symmetrical, but the symmetry is imperfect, while its sites are the face, shoulders, wrists, and, in general, the extensor aspect of the upper limbs, less commonly on the scalp, back, or lower members. It appears in a few weeks, but increases during months or years by growth and multiplication of its elements. After a time the component elements flatten out, spread in nummular patches which are occasionally margined, and end by becoming effaced, leaving behind an atrophic cicatrix often not apparent. They never ulcerate. The duration of the process is variable, from five to ten years or more. It is more common in females between the ages of fifteen and forty years. The lymph-nodes are sometimes enlarged. In many cases the patient has tuberculous lesions elsewhere.

2. The Gougerot type, still called *lymphosarcoid*, is an example of neoplastic reaction similar to the tissue of certain lymphosarcomata or mycosis fungoides developed around tuberculous follicles. It forms the intermediary between the Boeck type, lymphadenoma, and mycosis fungoides. Clinically, it appears in young or adult subjects, almost always on the thorax; the face and neck are rarely involved, and the limbs only exceptionally. The character and aspect of each lesion are uniform. They are small, round, dermic nodules, the size of a pea, projecting above the surrounding surface, hemispheric, pale-rose colour, with a darker centre and distinct borders. They possess no clinical malignancy. Their surface is smooth, never squamous nor with crusts. Their centre is translucent; macules do not occur. The eruption is very homogeneous.

3. The Darier-Roussy type is frankly hypodermic. The process is characterized by the presence of multiple nodosities seated in the hypodermis, sometimes isolated, round or oval, at others united together, forming knotty cords which follow the distribution of the vessels of the region; or the lesion may be in the form of large patches, irregularly bosselated and attaining 15 to 20 cm. in length. The size of these isolated tumours varies from that of a pin's head to a large nut. Typical tuberculous follicles are usually seen.

Arsenic in some form is the most used remedy; injections of the *Cacodylate of Sodium* are recommended. Old *Tuberculin*, *Radiotherapy*, intramuscular injection of *Calomel*, all have their advocates.

Chronic Papular Itching Eruption of Axillæ and Pubis (Fordyce).—Withers¹⁵ records a case of this rare condition in a girl, age 13, who had suffered from pruritus for three years, beginning in the axillæ and extending to the pubis and the breast. As the condition is very little recognized, the full report is appended.

Physical Examination.—The child appears to be fairly well nourished and developed, and without gross abnormality. No hair is visible in the axillæ, but over the pubis and vulva there is a sparse growth of short, lustreless, dark hair, showing little tendency to curl. In both axillæ, particularly, and in the region about the vulva, pubis, and areolæ of the breasts, the skin is roughened, pinkish in colour, overlying a brown discoloration. In all regions mentioned there are evidences of recent scratching.

On the abdominal wall above the pubis and in both axillæ are shiny, hemispherical, horny papules from 1 to 3 mm. in diameter. These tend to occur in rows following the lines of cleavage of the skin, which is pink tinged, thickened, and thrown into folds. Some of the larger and older lesions contain black depressed plugs and are capped with hæmorrhagic crusts. The more recent papules are glistening and show a central depressed grey punctum. The central plugs are extracted with difficulty and cause bleeding. No fluid escapes from the papules on applying firm pressure. On careful palpation, prickles of hair broken off at the level of the skin surface are felt as the fingers are moved toward the centre of the affected area.

There are seven or eight papules of similar nature about the areolæ of the breasts. These are in many respects similar to the hypertrophy of the glands of Montgomery during the first months of pregnancy. There is a darkening of the areolæ.

The labia majora are flabby, the skin thickened and pigmented. The labia minora are prominent and more darkly pigmented than the labia majora. The hymen is annular and stretched, admitting the tip of the index finger.

Histological examination showed much acanthosis, with hyperkeratosis, œdema, perivascular infiltration with small round cells, and enormous dilatation of the deep convolution of the sweat glands, with hyaline degeneration of the lining. The patient improved under general treatment directed to better her nutrition. Local antipruritic remedies proved disappointing.

Cutaneous Filariasis.—Montpellier and Lacroix¹⁶ contribute an important paper on a novel dermatosis seen very frequently by them in natives of West and Equatorial Africa, resembling scabies with an added erythema, and often erroneously diagnosed as that disease. There is a diffuse infiltration, with deepening of the normal markings of the skin, especially on the trunk, the thighs, and the loins; or in some places the rugose skin is replaced by areas of finely branny type with much thickening, recalling patches of nervodermite. Upon these areas, on any part of the body except the hands, feet, head, and genitals, numerous papules with shiny surface, resembling lichen, develop. The lesion at this stage may involute, or become capped with vesicles which speedily become pustular and form crusts, under which a depressed scar may result. Another type of lesion is also seen, a large flat papule, the size of a sixpence, which is excoriated over its whole surface and forms a crust covering greenish-yellow pus. The mucosæ are not affected, and the authors lay stress on the restricted distribution. Pruritus is severe, and constitutional symptoms such as malaise, articular pains, slight rise of temperature, and a typhoid type of general illness are frequently met with. There are marked eosinophilia, glandular enlargements, and fibrous subcutaneous tumours. The authors have established the causation by finding embryos of *Onchocerca volvulus* in the connective tissue, entirely outside the vascular plexus, and not found in the blood. The authors regard the lymphatics as the channel, and the fibrous tumours described above are 'filarial cysts', in which are found adult nematodes, male and female, described by Leuchart as *Onchocerca volvulus*. Treatment is directed to extirpation of the filarial cysts where possible; but unfortunately this is seldom practicable, and the affection remains a very intractable one. Arsenobenzol proved useless in the experience of the authors.

Cancers of the Skin (see also EPITHELIOMA; RODENT ULCER; SKIN, GENERAL THERAPEUTICS OF).—Williams¹⁷ analyzes a number of conditions of the skin which he classes as pre-cancerous, on the supposition that malignant degenerations may develop on the site of these manifestations. He discusses the probabilities of malignant change in pigmented moles, and gives the opinion

that the risk of such change is small except where the lesion is subjected to continuous friction, however slight. Moles in positions which entail friction might be removed with advantage. Electrolysis and freezing are not likely to produce malignancy in this type of lesion, as has been frequently suggested. Senile keratoma, which the author regards as undifferentiable from the seborrhœic wart, is on the other hand notably prone to develop malignancy. Syphilis and tubercle are frequent forerunners of cancer, largely, the author suggests, because of the tendency of these diseases to produce scars, in which cancer occurs. Two chemical agents have an evil reputation in this direction, tar and arsenic, and it is claimed that the irritant is chemical, not mechanical, soluble tar products being more effective in this sense than relatively insoluble products such as coal grit.

McCoy¹⁸ is wholeheartedly with Dubreuilh in the latter's opinion that there is a connection between *solar keratoses and cancer*. Solar burn is one of the most frequent causes of cutaneous cancer, and he dwells on the susceptibility of blondes to this development, and on the importance of the reflected rays, districts with light-coloured soil giving a larger crop of keratoses. He concludes his paper with the advice that all keratoses should be removed, advice in which he would certainly not be universally supported by opinion in this country.

Idiopathic Hæmorrhagic Sarcoma of the Skin.—Cole and Crump¹⁹ describe two cases, in one of which, the first seen, a Russian Jew, there was a coincident leukaemia (66,000 to 68,000 white cells, 3,500,000 to 4,000,000 red cells). Clinically there were very vascular red tumours on the feet, the legs, the arms, and the ears. Histologically these showed vascular hyperplasia, especially around the coil glands, and a spindle-celled neoplasm which would seem to relegate this case to a true sarcoma, rather than to Kaposi's disease. The second case occurred in an Italian, age 56, the earliest tumour appearing on the left hand twenty years before. The dorsum of the hand, the wrist, and later the lower extremities, were invaded by the same kind of growth. Histologically this showed much the same appearances as in the first case.

TREATMENT.—The second patient was put on local applications of 1 per cent Aluminium Acetate for the hands, injections of Cacodylate of Soda, 2 gr. daily, and the fingers, backs of hands, and lower limbs were X-rayed. Marked improvement was recorded.

Epidermophyton Infections.—White²⁰ reports 192 cases of eruptions diagnosed by him on clinical data as examples of this condition, and one factor of interest and differentiation from our experience in England is the large proportion of female cases, and also its occurrence in young children. The treatment he has used for the most part is the following ointment: Salicylic acid 2; benzoic acid 4; benzoated lard 3. [This would seem much too strong, but it is so written.—E. G. L.]

Dold²¹ reports some interesting experiments he made on epidermophyton fungus met with in Shanghai, where it is very common. The fungus when soaked in emulsion form into gauze remained active for nine days at room temperature, and for only six days at temperatures of 37°C. The fungus remained active in scales kept at room temperature for twenty-nine days, and only for nine days at temperatures of 37°C. The more rapid drying at the higher temperatures probably accounts for this material difference. The same author has another interesting communication²² on the causation of 'Hong-Kong foot', a local name for an affection of the toes which the author investigated, and found a fungus, identified with epidermophyton, in 95 out of 98 cases bearing this clinical diagnosis. Moreover, cultures inoculated into the toes of two healthy persons produced symptoms diagnosable as 'Hong-Kong foot'. (See also FUNGI, THE HIGHER, IN HUMAN DISEASES).

Seasonal Changes in Skin Disease.—Bettmann²³ examines the popular belief of an exacerbation of certain diseases in spring time, a belief as old as Hippocrates. He finds confirmation of the opinion in the case of several diseases. Urticaria and prurigo have seasonal variations, improving in winter and becoming worse in spring. To be distinguished from this group is 'summer prurigo', which is a light-dermatosis, and prurigo of Hebra, which is usually worse in winter. Ichthyosis is, in the author's experience, worse in the summer. Dyskeratoses generally are accentuated in the spring, notably Darier's disease. Erythema multiforme, erythema nodosum, and purpura have a time of increase in March to April, and October to November, as also is the case with herpes zoster, according to Kaposi. Brocq, on the other hand, found herpes more frequent in Paris in the interval between the end of spring and beginning of summer. The same author noted an increased frequency of 'erythème polymorphe douloureux' [roughly equivalent to our dermatitis herpetiformis].—E. G. L.] in April to June, and September to October. It is noteworthy that the curves of frequency of scarlet fever and erythema nodosum are very similar, while that of erythema multiforme is different. The author's own observations, in Heidelberg, show that erythema multiforme, erythema nodosum, purpuric eruptions, and zoster are at their maximum in spring and in autumn. Light-dermatoses are typical spring conditions, but light does not altogether explain their causation. Irritation is especially prominent in spring, and there may be something in the analogy of the flow of sap to explain a special condition of the tissues which in combination with exposure to light produces the effect. Thus, in pellagra and pseudo-pellagra, and variola, there is a general infection, as well as a light-influence.

Skin Capillaries.—Several articles in the German dermatological press are devoted to the consideration of a new microscope, the invention of Müller, of Tübingen, for the observation of the skin capillaries. Thus Niekau²⁴ has a long article describing his experience. The magnification is about 40, and one of the conditions of its use is a good illumination. The skin is smeared with cedarwood oil, and the microscope is applied direct to it, the upper border of the finger just above the lunule of the nail being one of the best sites of observation. It is claimed that the skin can be examined to the level of the subpapillary plexus, which is rendered visible. Several diseases are dealt with in detail. The scab of a *post-scabietic eczema* showed capillaries dilated and an air-bubble at the orifice of the hair follicle. There was much dilatation in *psoriasis*. In *Werthof's purpura* there was increased visibility, and increased number of capillaries, which were fuller than normal, and showed hæmorrhages in the uppermost meshes of the subpapillary plexus. Vessels were thrombosed and showed hyaline degeneration and obliteration of end-capillaries. Petechiæ were the result of obstruction of veins. It was interesting to note the persistence of dilatation as the result of exposure to *Alpine sun lamps*. An exposure of five to fifteen minutes could leave effects which were not eliminated at the end of a week. The microscope also offers rich opportunities for the study of pigment. Pigment protects the endothelium and vessels from baneful effects of light, and the body sets about making a protective mantle of pigment-cells as speedily as it can when light-stimulus is applied. If the radiation is too sudden for these efforts to come into play, the protective mechanism resolves itself into the production of an intense hyperæmia, or, as the author fancifully puts it, "the body hoists a red umbrella", to protect the deeper parts from injury. In *Röntgen burns* the injury is greater, the skin seems torn apart, there is more hyperæmia, and more persistent and deeper degeneration. In *polycythæmia* there is much widening of vessels, and a mechanical destruction, with increased viscosity of blood. In *scarlet fever* the

appearances are said to be so characteristic as to present a means of diagnosis. There is an extraordinary paralysis of vessels, which may be noted as late as forty-three days after inception. In *syringomyelia* the supply of vessels was richer than normal, and the ground was a bright-orange tint. There was an increased visibility of vessels, and higher degree of filling, especially in the area of altered innervation. In *erythromelalgia*, in the affected sites, there was extensive bleeding and filling of the capillaries, the vessels were much relaxed, and there was a flattening of skin-furrows. In *Raynaud's disease* and *sclerodermia* there was much pigmentation and also atrophy of pigment. In the pigmented areas vessels are seen with difficulty.

Meta Holland and Louise Meyer,²⁵ working in Müller's clinic with the microscope above described, concerned themselves chiefly with observations of children, in whom the capillaries are abnormally wide, long, and anastomosing. The same character may be found in some adults, but in them really indicates an abnormality in the direction of tendency to exudative disease, and the authors expressly state that their researches confirm, rather unexpectedly, the soundness of old French theories of 'diatheses'. The exudative diathesis in infancy is shown by vasomotor dilatation, and in older years by arteriosclerosis.

REFERENCES.—¹*Med. Record*, 1920, May 15, 824; ²*Jour. Amer. Med. Assoc.* 1920, Nov. 22, 565; ³*Arch. of Dermatol. and Syph.* 1920, July, 61; ⁴*N.Y. Med. Jour.* 1920, Feb. 21, 325; ⁵*Jour. Amer. Med. Assoc.* 1919, Aug. 30, 653; ⁶*Arch. of Dermatol. and Syph.* 1920, Aug., 137; ⁷*Brit. Med. Jour.* 1920, Oct. 30; ⁸*Arch. of Dermatol. and Syph.* 1920, April, 365; ⁹*Ibid.* 370; ¹⁰*Jour. Amer. Med. Assoc.* 1919, Nov. 22, 1580; ¹¹*Arch. of Dermatol. and Syph.* 1920, March, 256; ¹²*Ibid.* 270; ¹³*Ibid.* April, 396; ¹⁴*N.Y. Med. Jour.* 1920, Jan. 10 and 17; ¹⁵*Arch. of Dermatol. and Syph.* 1920, Jan., 8; ¹⁶*Presse méd.* 1920, Sept., 607; ¹⁷*Arch. of Dermatol. and Syph.* 1920, Aug., 168; ¹⁸*Ibid.* Feb., 175; ¹⁹*Ibid.* March, 283; ²⁰*Jour. Cutan. Dis.* 1919, Aug., 501; ²¹*China Med. Jour.* 1920, Jan., 34; ²²*Arch. f. Schiff's- u. Tropenhyg.* 1919, Oct., 469; ²³*Munch. med. Woch.* 1920, June 4, 856; ²⁴*Deut. Arch. f. klin. Med.* 1920, July, 301; ²⁵*Munch. med. Woch.* 1919, Oct. 17, 1101.

SKIN, GENERAL THERAPEUTICS OF. E. Graham Little, M.D., F.R.C.P.

Cacodylate of Soda and Hyposulphite of Soda in Large Doses.—Ravaut¹ considers one of the best means of treating Eczema is by intravenous injection of cacodylate of soda in doses of 10 to 30 cgrms. repeated daily, or in larger doses at intervals of three or four days. An average experience is the injection of 15 to 20 grms. in solutions of 10 per cent, during three weeks' treatment. In some cases of eczema which do not respond to that treatment, Ravaut alternates with the foregoing treatment injections of hyposulphite of soda, in doses of 4 to 15 grms. daily, in solutions of 20 per cent. This method is particularly applicable to extensive erythrodermias, such as sometimes follow on administration of novarsenobillon, and is of value in Urticaria, Furunculosis, and, as has been said, in eczema.

Vaccine Therapy in Skin Diseases.—Guidi² gives an analysis of twelve cases of children under 2 years of age treated for Staphylococcal Infections with an autogenous vaccine, and is a strong advocate of this method.

Adamson³ gives it as his opinion that vaccine therapy is of doubtful value in the treatment of chronic sycosis, acne, furunculosis, and staphylococcal impetigo, and he deprecates the use of tuberculin in lupus. Whitfield, on the other hand, makes the much more guarded statement that some cases have undoubtedly improved with vaccine treatment, and some have remained unaltered by it, very few aggravated by it. He advises in cases which appear unduly obstinate to ordinary treatment a preparation of autogenous vaccine, the use of which will often produce speedy good effects. Sometimes also there may be repeated fresh inoculation of the patient by contact with infected

clothing, and vaccines are obviously to be used with an open mind as to these possibilities. He finds vaccine treatment discreetly applied most useful in **Furunculosis**. Again, in certain cases of **Chronic Eczema** associated with intestinal dyspepsia, a vaccine made from the faecal bacteria will often help materially in curing the eczema.

Sequeira and Western dispute Adamson's conclusions, and highly praise vaccine therapy in furunculosis. They are less enthusiastic of its effects in pustular folliculitis, advocate the use of vaccine in **Erysipelas**, and have had brilliant results in some **Mixed Infections** by trying out the various organisms found.

In dry types of **Lupus** tuberculin is useless, but it is valuable in ulcerative forms. In **Keratoderma Blennorrhagica** gonorrhoeal vaccines have been used with great benefit. In acne vulgaris results have been very irregular and unpredictable.

MacLeod and Topley praise vaccine therapy in **Furunculosis** of acute types, and find it less successful in chronic conditions. In **Bullous Impetigo** auto-genous streptococcal vaccines have perhaps been of benefit. In acne vulgaris and sycosis results have been disappointing. In tuberculosis these authors concur with the general expressions of disappointment in the use both of Koch's old tuberculin, which is too dangerous to be recommended, and of bacillary emulsions.

Quartz Lamp.—Oliver⁴ recommends this agency in **Ulcers**—especially of the leg—with varicosity, the dose being calculated to produce a marked erythema around the ulcer. An average initial exposure is recommended of two minutes at a distance of ten inches from the source of light. The ulcer itself and a band of skin an inch wide round it are exposed, the rest of the skin being protected by paper or gauze. The resulting erythema usually lasts about a week, and weekly exposures are recommended. In **Port-wine Nævi** the lamp is beneficial, the Kromayer apparatus being in this class of case better than the so-called 'Alpine-sun' lamp. Exposures of five to twenty minutes are recommended, and the production of a 'blistering burn' is aimed at. **Alopecia Areata** is very usefully treated by this means; exposures at intervals of three weeks are advised, and improvement may be expected after about five such exposures. In **Psoriasis** the lamp may clear resistant patches, and psoriasis of the nails is said to react well with the light. **Eczema** and **Pruritus** are also often greatly relieved by its use, and in selected cases of **Acne Vulgaris** its value is undoubted.

Radium.—Morrow and Lec⁵ recount their experience of the past three years with radium.

Basal-celled Epithelioma.—By this means 112 cases were treated, of which the condition cleared up in 89, without recurrence at the time of writing; in 15 cases there were recurrences, and 3 were too advanced for treatment to hold out any hope.

Squamous-celled Carcinoma.—There were 19 inoperable cases treated, with healing and possible cure in 5 cases, and no response in 14 cases.

Sarcoma.—The cases were too few to tabulate, but results were favourable.

Nævi.—The method is recommended especially in cavernous angioma, in horny and warty nævi, and in pigmented nævi, but it was a disappointment in flat 'port-wine stains'.

Warts.—The method is applicable to all varieties of warts, but especially the plantar type.

Keloid.—In recent keloid and in young subjects radium is especially useful.

Lupus Erythematosus.—The authors prefer radium to any other form of treatment. The exposures should be of short duration, frequently repeated.

Pepsin.—An aqueous solution of pepsin is claimed by Unna to be of value in connection with drug treatment (p. 17).

REFERENCES.—¹*Presse méd.* 1920, Jan. 28, 73; ²*Jour. Amer. Med. Assoc.* 1919, Nov. 15, 1562; ³*Brit. Jour. Dermatol.* 1919, xxxi, 75; ⁴*Boston Med. and Surg. Jour.* clxxxiii, No. 6, 155; ⁵*Jour. Amer. Med. Assoc.* 1919, Nov. 15, 1523.

SKIN-GRAFTING.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Skin-grafting by means of Freezing with Ethyl Chloride.—Gaston Torrance,¹ a number of years ago, devised the following method of skin grafting. Since that time he has used the method in a number of cases, and has found it quite satisfactory in small areas in which there has been considerable destruction of tissue, as in deep burns or ulcers; patients with painful leg ulcers exposing a nerve have experienced immediate relief. The thigh is shaved and cleaned with ether and alcohol; and an area on the top of the thigh about the size of a silver dollar is frozen and is cut out with a sharp razor just within the frozen area, going well down into the fatty layer. The grafts are applied immediately to the granulation surface, and when they become 'thawed out' they will be found to be firmly glued to this surface. They very rarely show a tendency to separate if the granulations are in good condition when the grafts are applied, and if care is taken not to rub them off. A dry dressing is applied, and is changed every day if there is any discharge from the surrounding granulations. The grafts when successful are firmly adherent and stand out above the granulation surfaces like normal healthy tissues.

Technique for Reverdin Skin-flaps.—Instead of using a razor, as for Thiersch flaps, Dubreuilh² lifts up the skin with a curved needle held at a right angle in hæmostatic forceps, with the tip curving up. He pricks the skin with this tip, and as the skin is thus raised he cuts out the lifted-up portion with a sharp bistoury. The needle thus has a small disc of skin impaled on its tip, and this disc is transferred to the defect to be covered. By this means quite a large defect can be rapidly covered with forty or fifty of these discs, about 2 mm. in diameter; larger than this it is hard to detach the scrap, and smaller than this the scrap may be lost when cut out. No anæsthesia is necessary; the patient feels merely the prick of the needle. He applies the grafts about 4 or 8 mm. apart, and takes them from near by. When all are in place, he covers the surface with numbers of small pieces of gauze, a few centimetres wide, placed individually, watering with artificial serum, and presses them down with his hand. The gauze dressing is changed in forty-eight hours, but the lowest layer of gauze can be left untouched, watering copiously with physiological serum. The flaps take hold by the sixth or seventh day. They heal as cicatricial tissue, with the danger of retraction, but they accomplish the healing in cases in which otherwise it would take much longer or be impossible. These minute flaps can be taken so easily and leave such insignificant gaps in the skin that, even if the procedure fails, not much harm has been done. In one case a Röntgen dermatitis on the back, as large as a plate, had shown no tendency to heal during the year; but applying these needle-grafts to the more favourable points in turn, led to the complete healing of the lesion in two months. The lesion seems to feel a stimulating action from the grafts, even at points where the latter do not touch.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1920, April, 405; ²*Jour. de Méd. de Bordeaux*, 1919, Dec. 25, 545 (abstr. in *Jour. Amer. Med. Assoc.* 1920, Feb. 14, 493).

SKULL, SURGERY OF. (See CRANIAL SURGERY.)

SLEEPING SICKNESS. (See TRYPANOSOMIASIS.)

SMALL-POX. (*See also* VACCINATION.)

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—Colonel W. G. King¹ classifies small-pox as follows: (1) The most virulent form, which he terms the 'Eastern type', occurs east of longitude 40° E. and between latitudes 40° N. and 6° S. (2) West of longitude 40° E. virulence is diminished, and a strain is found capable on rare occasions of reverting to the primitive form. The general fatality in pre-vaccination days was from 18 to 25 per cent; since that time it has been rarely more than 7 per cent in the vaccinated, but it has been as high as from 19.3 to 47 per cent in unvaccinated persons. (3) In certain West European countries, mostly those which enforce vaccination, the fatality is sufficiently reduced to justify the recognition of a 'Western substrain'. (4) In South Africa there is a second type of small-pox, distinguishable both from the Eastern type and its Western strain or substrain by the mildness of the constitutional symptoms in spite of considerable skin disturbance. The general fatality is not more than 4.3 per cent. From this source has probably evolved a strain of low virulence ('amaas strain'), which has appeared in races of European origin in America, Canada, and Australia.

(*See also* MEDICAL ANNUAL, 1920, p. 321.)

G. G. Johnstone² gives an account of an outbreak of small-pox in occupied Germany which was traced to a Polish soldier who had recently been demobilized from the German army. In all there were 30 cases, 4 of which died, and 3 of these belonged to the nursing staff of the hospital. As no isolation hospital of any kind existed in this part of Germany, temporary huts were provided by order of the British military authorities for the isolation of small-pox cases and suspects. A general vaccination of the inhabitants was also enforced. The high incidence of the disease among old persons was shown by the fact that 8 (about two-thirds) of the occupants of an almshouse contracted small-pox, 5 of whom were aged 70 years and over.

SYMPTOMS.—M. Puig³ records two cases of small-pox in children, age 2 and 5 respectively, which began with symptoms resembling meningitis. On lumbar puncture, which was performed in one case, 85 c.c. of clear non-albuminous fluid were withdrawn under pressure, thus indicating the presence of serous meningitis.

J. K. Haworth⁴ reports a case of small-pox simulating acute appendicitis, the symptoms of which subsided on appearance of the eruption.

DIAGNOSIS.—According to G. Sobernheim,⁵ *Paul's test* is of great value in the diagnosis of small-pox. It is generally agreed that a positive reaction is a proof of small-pox, though a negative result is not conclusive. The method consists in inoculating the cornea of a rabbit with the contents of the suspected pustule, and examining the result in thirty-six to forty-eight hours. If the case is one of small-pox, the cornea in the neighbourhood of the inoculation remains clear, and shows fine elevations at the infected site only. These can be recognized by means of a hand lens, but are more distinct after killing the animal, enucleating the eyeball, and placing it for a short time in sublimate alcohol. The cornea at once assumes a greyish opacity, from which the nodules stand out in the form of chalky white isolated or confluent lesions. This characteristic appearance is only found on inoculation of variola or vaccine virus.

TREATMENT.—W. Bender⁶ regards local applications of **Potassium Permanganate** as superior to every other form of treatment of small-pox. On admission to hospital the whole body of the patient is painted over with a freshly prepared saturated solution of potassium permanganate. On the following days, according to the sensitiveness of the skin, a saturated solution, or 1.5 per cent solution, or one weaker still, is used. Bender claims that this treatment

prevents complications, such as septic fever from absorption, extensive purulent bedsores, and metastatic abscesses, shortens convalescence, and reduces to a minimum the degree of subsequent scarring.

REFERENCES.—¹*Brit. Med. Jour.* 1920, i, 778; ²*Lancet*, 1920, i, 1105; ³*Rev. Españ. de Med. y Cir.* 1920, 110; ⁴*Lancet*, 1919, ii, 201; ⁵*Cor.-Blatt. f. schweiz. Aerzte*, 1919, 1849; ⁶*Berl. klin. Woch.* 1919, 1160.

SPASMOPHILIA.

Frederick Langmead, M.D., F.R.C.P.

ETIOLOGY.—J. Epstein¹ points out that there are three evident factors in the etiology: (1) A faulty nervous system readily susceptible to convulsive seizures; (2) A general pathological process which keeps the nervous system in a hypertonic state; (3) A reflex irritant which, when added to the other factors, upsets the neuromuscular structure. Of these the first factor, the underlying nervous anomaly, is always present. The nature of the second is undetermined, though disturbances of the ductless glands, especially of the parathyroids and thymus, may be of importance, and metabolic disorders and abnormalities of nutrition, especially rickets, seem to play a part. In any case there is a deficiency of calcium salt in the body, which may be the immediate cause of the undue nervous excitability. The third factor is frequently present in childhood: reflex irritants, gastro-intestinal disorders, acute infections and intoxications may act as excitants to the brain and cause the convulsion, though the irritant may be one which would have no effect upon the nervous system of a normal child.

MANIFESTATIONS.—Epstein divides the manifestations of this disorder into three groups: (1) Those of the spasmophilic state; (2) Late, latent, or obscure spasmophilic disturbances; (3) Local or general spasmophilic convulsions. The spasmophilic child has an increase in all reflexes. He is usually irritable, sleepless, restless, and bad-tempered. There is an over-excitability of the peripheral nerves, and the signs described by Chvostek, Troussneau, and Erb are present. The author is on less firm ground when he deals with what he calls the late, latent, or obscure disorders, for he includes among them mild cases of laryngospasm and cardiac irregularity, and some cases of pylorospasm, periodic vomiting, spastic constipation, peristaltic unrest, and repeated attacks of abdominal colic of obscure etiology. In his view, bronchial spasm or asthma may be the pulmonary expression of the spasmodic diathesis, and persistent enuresis and vasomotor pallor have their origin in the same state. He holds that these cases are not unusual, and are generally incorrectly diagnosed and improperly treated. His description of the third group—local or general spasmophilic convulsions—includes general convulsions, tetany, and laryngismus, and differs in no way from that usually given.

DIAGNOSIS.—Epstein says that this is sometimes beset with difficulties, especially in the case of the obscure or latent spasmophilic disorders, when it can only be arrived at by a history of the spasmophilic diathesis, by the signs and symptoms of other spasmophilic manifestations, and by the exclusion of other pathological processes. The general convulsions must be distinguished from those due to epilepsy, to cerebral inflammations, severe toxæmias, and uræmia. The convulsions are commonest in young children, are frequently repeated, and there are other evidences of spasmophilia; whereas epileptic attacks are usually not multiple, and are preceded by an aura and followed by sleep. [A history of an aura in a child of the usual spasmophilic age would be very difficult to obtain, and an aura even in older children is often absent in epilepsy in our experience.—F. L.]

PROGNOSIS.—In a marked case this is very uncertain. As a rule the convulsions stop sooner or later, but some children undoubtedly remain in a state

of submentality, either as the result of their underlying nervous abnormality or of the convulsive attacks.

TREATMENT.—The treatment advocated consists in prevention, proper diet, and medication. An infant with spasmophilic tendencies should be breast-fed, if possible, and the irritable nervous system should be protected by plenty of rest, sleep, and quiet. Older children must have a sufficiency of physical and mental rest and a proper nourishing diet consisting chiefly of fat and carbohydrates. For the active signs, **Calcium Bromide**, **Belladonna**, and **Phosphorus**, with **Cod-liver Oil**, are recommended. During a general convulsion, **Chloroform** inhalation, **Chloral Hydrate** by the rectum, or **Magnesium Sulphate** subcutaneously, will usually prove satisfactory. Later, the skin, kidneys, and bowels must be caused to function properly. In his experience **Bland Diet**, **Bromides**, **Belladonna**, and **Phosphorus**, with **Cod-liver Oil** or **Malt and Cod-liver Oil**, will relieve the spasmophilic spastic constipation, peristaltic unrest, and repeated attacks of abdominal colic.

REFERENCE.—¹N. Y. *Med. Jour.* 1919, Nov. 22, 851.

SPINAL CORD, GUNSHOT WOUNDS OF.

Thorburn,¹ in a valuable article in the *British Journal of Surgery*, describes selected specimens from the War Collection in the Museum of the Royal College of Surgeons of England, and draws the following conclusions:—

Gunshot injury of the spinal cord may be due to:—

1. The direct impact of a missile, which may either penetrate it completely, or remain embedded in it, and which is liable to be accompanied by fragments of clothing, and especially of bone. (*Plate XXXI, Figs. A, B.*)

2. The indirect impact of fragments of bone, which again may penetrate completely, may remain embedded, or may recoil towards the positions from which they were dislodged, although such recoil is far less common and less obvious than in fractures of the vertebral bodies as seen in civil life. (*Plate XXXI, C.*)

3. Contusion by: (a) Foreign bodies which enter the spinal canal but do not penetrate the theca; (b) Displaced fragments of bone protruding slightly into the vertebral canal; (c) Displacement of the soft parts only, or, rarely, subluxation of the bones—the widely-spread divulsive or ‘explosive’ action of a missile passing by at a high velocity. (*Plate XXXII, Figs. A, B.*)

In all cases the cord is liable to present mechanical destruction and hæmorrhage extending widely beyond the area of apparent injury, and affecting especially the grey matter of the anterior cornua, where it produces long spindle-shaped areas of destruction (*Plate XXXIII, Fig. A.*) Such extension of hæmorrhage is more widely spread where the missile is of higher velocity.

In the case of direct impact by foreign bodies, septic meningitis will generally ensue, but such meningitis is less common when impact is due only to fragments of displaced bone. It is generally absent in contusions of all forms, and the torn dura mater is highly resistant to infection.

Meningitis tends strongly to extend upwards rather than downwards, and is usually continuous, but may spread unobtrusively along the membranes, to blaze up at remote points (*Plate XXXIII, Fig. B.*)

Hæmorrhage sufficient to cause serious compression is very rare, but it is usually present in such quantities that, should life be prolonged, it may readily give rise to well-defined cicatrices, which will tend to assume the annular and constricting type often found at operation.

REFERENCE.—¹*Brit. Jour. Surg.* 1920, Oct., 202.

PLATE XXXI.—GUNSHOT WOUNDS OF THE SPINAL CORD

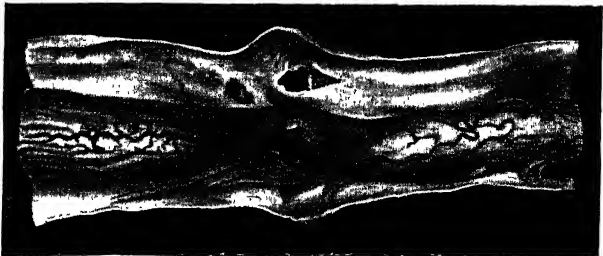


Fig. A.—Fragment of metal impacted in cord; tear in theca, localized meningitis.

MEDICAL. ANNUAL, 1891



Fig. B.—Fragment of metal impacted in cord; tear in theca, hemorrhage and septic meningitis.

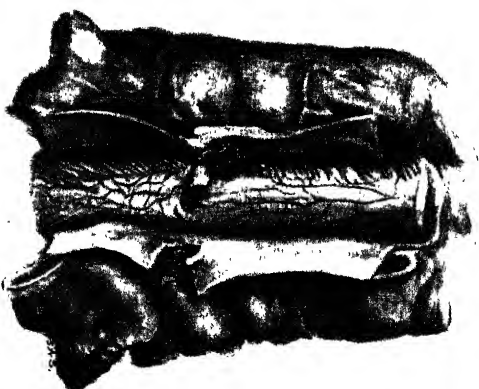


Fig. C.—Impaction of metal in theca and of bony fragment in cord; no septic infection.

From the 'British Journal of Surgery'

PLATE XXXII.

GUNSHOT WOUNDS OF THE SPINAL CORD



Fig. A.—Contusion of membranes and cord without penetration of vertebral canal.



Fig. B.—Contusion of cord. No injury to theca.

By kind permission of the 'British Journal of Surgery'

PLATE XXXIII.

GUNSHOT WOUNDS OF THE SPINAL CORD



Fig. A.—Slight bruising of theca; extensive injury to cord.



Fig. B.—Septic meningitis extending up entire cord.

By kind permission of the 'British Journal of Surgery'

PLATE XXXIV.

SPINAL TUMOURS



Extramedullary tumour lying in front of a posterior spinal root.

By kind permission of the 'American Journal of the Medical Sciences'

PLATE XXXV.
SPINAL TUMOURS—*continued*

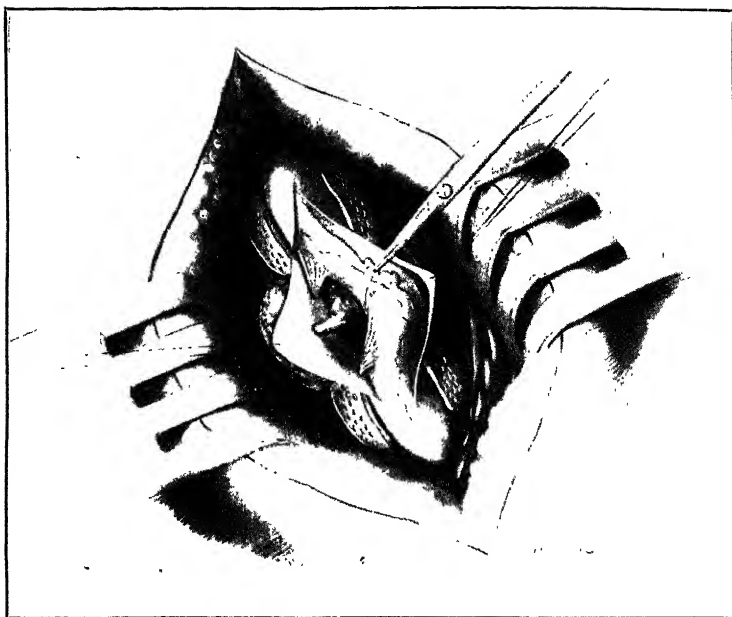


Fig. B.—Exposure of a tumour lying in front of the spinal cord by traction on a slip of the dentate ligament. (Note that the growth is an extension of an extradural tumour.)



Fig. C.—Dural endothelioma which has markedly flattened the cord.

SPINAL SURGERY.*J. Ramsay Hunt, M.D.*

Spinal Tumours.—Spinal tumours occur most often outside the cord. They may originate either from the cord, from the spinal membranes, or from the soft tissues surrounding the dura.

Of 67 spinal tumours operated upon by C. A. Elsberg,¹ 49 were extramedullary and 18 intramedullary. In 42 the new growth occurred inside the dura mater. Tumours are most frequently met with on the posterior aspect of the spinal cord. They often lie in or near the median line over the origins of the posterior spinal nerve-roots; they may develop more to one side of the cord behind the roots of that side. As the dentate ligament marks the boundary between the anterior and posterior halves of the cord, any tumour that develops behind the dentate ligament must be considered as lying on the dorsal aspect of the cord.

Some growths develop in front of the posterior roots, but behind the dentate ligament, and these stretch the posterior roots as they enlarge (*Plate XXXIV*). These growths are most liable to cause severe root pains from the beginning of the symptoms.

Of the 31 extramedullary (intradural) tumours of this series above the level of the cauda equina, 24 lay either on the posterior surface of the cord or posterolaterally, and 14 of the 18 cases of intramedullary tumour seemed to occupy more especially the posterior parts of the spinal cord. In 7 patients with extramedullary tumours (33 per cent) the growth was found either anterior or anterolateral to the cord. When these growths are exposed by the surgeon, they are usually found to be covered on their posterior surface by the dentate ligament or one of its slips. Usually, one of the attachments of the ligament to the inner surface of the dura has to be divided and the ligament has to be retracted before the tumour can be sufficiently exposed for its removal (*Plate XXXI, Fig. A*). These anterolateral growths only rarely begin with root pains; their course is often a painless one, and it is frequently difficult to differentiate them from intramedullary growths.

If the tumour is found to be adherent to several structures its origin cannot be determined with certainty. It is sometimes very difficult to differentiate between a subpial or septal new growth and a true intramedullary one. These septal and subpial tumours may be surrounded on all sides by cord tissue, and for their removal an incision into the cord may be required. It may very well be possible that some of the growths we have described as intramedullary were really examples of septal or subpial tumours which had grown into and become buried, as it were, in the tissue of the cord.

Injury to the Cord by a Tumour in its Proximity.—Every expanding lesion within the spinal canal will, sooner or later, exert pressure upon the spinal cord (*Plate XXXV, Fig. B*), but the amount of compression is not directly proportionate to the size of the growth or its duration. Large tumours are more liable to be of softer consistency than small ones, and it is the small, hard tumours that cause, in many instances, early severe damage to the cord structure.

From the appearance of the cord at the time of the operation, no conclusions can be drawn regarding the amount of improvement that can occur. As it is always inadvisable to handle or even touch a part of the cord that has been subjected to pressure for a long time, the operator can seldom determine the exact condition of the affected cord. It is quite astonishing, however, how great an improvement may occur in a cord that appears at operation to be flattened to a thin tape size. Much greater improvement may be expected in a flattened cord than in one in which there is a deep depression from a small hard tumour.

DIAGNOSIS.—Of the 67 patients in the series, the diagnosis of tumour was made or suspected 60 times; in the 7 other patients a tumour was considered one of the possibilities. In order to obtain a fair idea of the diagnostic possibilities, however, all of the operated patients should be mentioned in whom a tumour was considered either certain, probable, or possible. In all there were 105 patients in this category. In 70 patients the diagnosis of tumour was made or considered probable, and in 60 of the patients a tumour was found at the operation. In 35 a tumour was considered possible but not probable; in only 7 of these was a tumour found at operation, and 5 of the 7 had an irremovable intramedullary growth. The 28 patients in whom a tumour could not be excluded and in whom an exploratory operation was performed, suffered from one of the following conditions: malignant disease of the spine, pachymeningitis, adhesive arachnitis, neuritis of the cauda equina, multiple sclerosis, gliosis, funicular myelitis, or abnormal spinal vessels with intramedullary disease.

SURGICAL TREATMENT.—If the growth lies on the posterior surface of the cord, and is not adherent to that structure, it can often be 'picked out' of the spinal canal with the division of perhaps only a few fine adhesions. If, however, it lies under a nerve-root or in front of the dentate ligament or the cord itself, the manipulations must be very carefully accomplished. It is always inadvisable to attempt to pull out a tumour from under a nerve-root, as such a procedure might cause serious injury to the cord. Either the nerve-root or roots must be carefully raised and pulled apart by fine strabismus hooks, or, if sufficient room cannot be gained, the roots must be divided. Similarly, the surgeon should never attempt to pull out a tumour from under a slip of the dentate ligament. The slip should be divided and retracted in order to expose the new growth. When a tumour is to be removed from in front of the cord, the following procedures are of value: By the division of one or two slips of the dentate ligament and of one posterior nerve-root (if necessary) the cord can be pulled well to one side. This should be done with forceps which grasp the slips of the dentate ligament that have been divided, and not by direct pressure upon the cord. The operator should never make the attempt to pull the cord to one side by means of traction on one or more nerve-roots. A pull on a nerve-root sufficient to draw the cord to one side is almost certain to injure the cord itself. Another important detail in the exposure and removal of tumours which lie in front of the cord is to remove much more of the laminae on one or other side, so that the access to the front of the cord from that side is made more direct. Tumours which have originated from the pia mater on the cord are sometimes so firmly adherent that in their removal a small layer of cord tissue would come away with the growth. If the adhesion is a very firm one, it is preferable to leave behind a small piece of the capsule of the growth. If the neoplasm is not found at the exposed level, a careful search must be made for it. The appearance of the veins on the posterior surface of the cord is very characteristic when there is an obstruction to the return flow of blood at a higher level. In addition, a probe should be carefully passed upward and downward on the posterior and anterior aspects of the cord. An elastic resistance is often felt when the end of the probe impinges upon a tumour higher up or lower down than the exposed area.

Of the 67 patients in the series, 7 died after the operative interference; in the operations for extramedullary tumours there was a mortality of 6 per cent.

OPERATIVE RESULTS.—The mortality of the operation of laminectomy and removal of a spinal-cord tumour should not be large. Elsberg's results are:—

Relation of tumour to cord	No. of cases	Tumour removed	Tumour partly removed	Tumour not removed	Deaths	Recovery	Recovery per cent
Extramedullary ..	31	31	—	—	2	29	94
Cauda equina ..	11	1	8	2	2	9	82
Extradural ..	7	3	1	3	1	6	86
Intramedullary ..	18	4	2	12	2	16	89
Total ..	67	39	11	17	7	60	90

Symptoms and Signs of Atlas Fracture.—Geoffrey Jefferson² reports four cases of fracture of the atlas vertebra, and gives a review of those previously recorded. The outstanding clinical signs of fracture of the first cervical vertebra are rigidity of the neck muscles and limitation of movement. The latter is naturally greater in those cases where the fracture actually involves the articular facets; but it is a very definite feature when the arches alone are broken. In atlas fracture the patient tends to hold himself stiffly, as if balancing a weight upon his head, and may support his head with his hands, particularly when

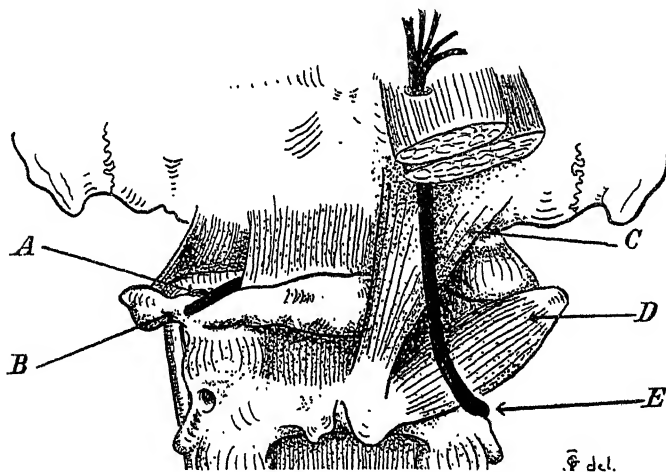


Fig. 51. —The relationship of the suboccipital and great occipital nerves to the posterior arch of the atlas. A, Vertebral artery. B, Suboccipital nerve. C, Rectus capitis posterior major. D, Inferior oblique. E, Great occipital nerve.

(Figs. 50, 51, 52, by kind permission of the 'British Journal of Surgery'.)

making any change from the upright posture. In some cases a protuberance may be felt in the pharynx, at the level of the palate, painful on pressure. This is especially the case when the anterior arch is broken. In one recorded instance crepitus has been thus detected through the mouth. More commonly the greatest tenderness is elicited by pressure either on the lateral masses in the neck, or on the posterior arch through the outer fibres of the trapezius. Another symptom, which not only these cases but also rotatory dislocations sometimes present, is that of dysphagia and thick speech. The cases presenting it have not been closely enough examined from the neurological standpoint to

establish whether this is of central or peripheral nervous origin; it does not seem to be entirely mechanical.

Nerves.—Owing to the very close relationship between the first two cervical nerves and the posterior arch of the atlas—the one passing over it, the other under—it would be surprising if signs of injury to these nerves were not common. Of the two nerves, the great occipital, passing below the posterior arch, suffers more obviously than the suboccipital, which lies upon it. A lesion of the great occipital nerve is a great aid to diagnosis, and the presence of an anæsthesia or neuralgia in the area of its distribution should lead to a very careful investigation of the atlas vertebra (*Fig. 50*).

Vertebral Artery.—This has been found compressed in one case, and was torn by a bone fragment in another patient.

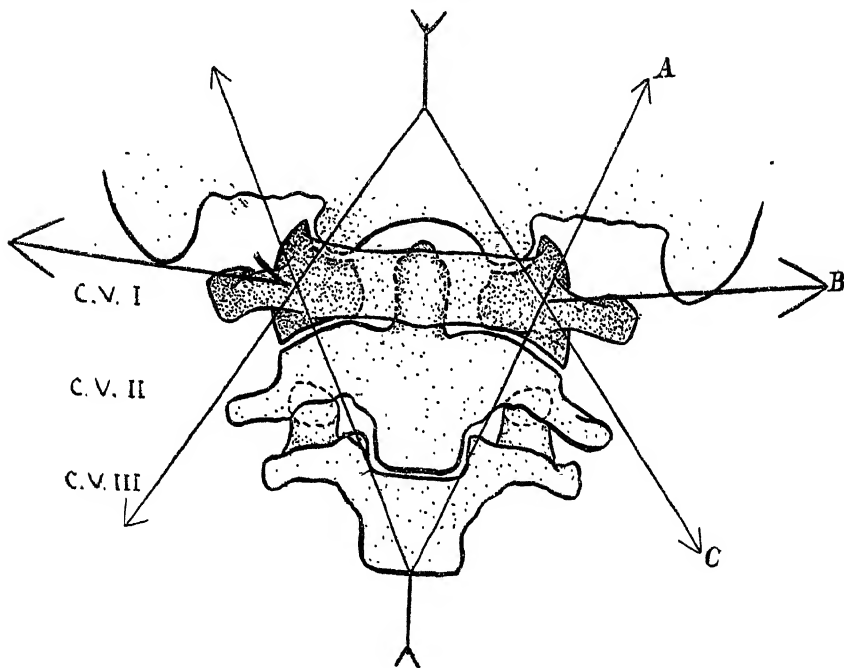


Fig. 51.—Schematic representation of the transmission of force (A and C) through the occipital condyles to the atlas, axis, and vertebral column. Note that the resultant (B) of these forces is more or less horizontal, and 'spreads' the atlas laterally.

Cord Injury.—Signs of cord injury, varying from a monoplegia to complete paralysis of all four limbs, were present in 19 cases, and only 4 of these recovered. Injury to the cord is more often found in complicated than in isolated fractures of the atlas, and this is due not only to the excessive violence which the complicated fractures imply, but also to the fact that the actual cord injury is sometimes caused by the accessory fracture, the atlas itself having inflicted no injury on the spinal cord. There are two factors at work in the case of the atlas, both tending to immunity of the cord from injury. One is the relatively large size of the neural compartment of the

atlas ring; the other is the manner of the displacement of the broken fragments. The last depends on the peculiar mechanism of the fracture (*Figs. 51, 52*), which tends to open out the circumference of the atlas, the fragments travelling in a centrifugal rather than a centripetal direction. It is not surprising, therefore, that the cord should escape damage as often as it does, but rather what one would expect.

TREATMENT.—Unless there are positive neurological signs of cord injury, and unless the correlation of the signs with the position of the broken fragments as seen on the *x*-ray plate leads to the belief that good can be done by laminectomy, treatment should be conservative and directed towards immobilization. In only two of the cases in this series was operation undertaken, and both patients died. In one other case it was found at autopsy that laminectomy might have led to recovery, for here a small piece of bone had pressed

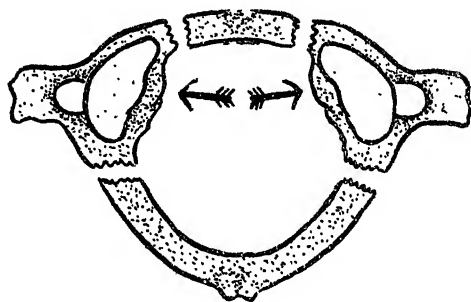


Fig. 52.—Atlas viewed from above to show the result of 'spreading,' the bony arch yielding at its weak points.

on the medulla and produced gradually increasing paralysis and death. Such cases are rare. Treatment will, as a general rule, be confined to securing immobility of the head, preferably in a plaster case of the Lorenz type or in a 'Minerva' plaster, followed by a leather casket if necessary.

Condition of a Case of Complete Division of the Spinal Cord by Gunshot Wound Nineteen Years after the Injury.—A case that W. B. Cadwalader² describes in the *Annals of Surgery* is the same as the one reported by Drs. Stewart and Harte in the *Philadelphia Medical Journal* 19 years ago as "A case of severed spinal cord in which myelorrhaphy was followed by partial return of function".

This case is of interest since it proves that complete division of the cord is not in itself necessarily fatal, for, if automatic emptying of the bladder can be re-established, it is possible for the patient to live a comfortable chair life indefinitely. Furthermore, it goes to prove that even under the most favourable conditions for surgical procedure, return of function does not occur, for in this case the separated ends of the severed spinal cord were approximated by sutures within three hours of the injury, and after careful nursing for nineteen years no clinical sign of a return of function has appeared.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1920, Feb., 194; ²*Brit. Jour. Surg.* 1920, Jan., 407; ³*Ann. of Surg.* 1920, June, 79.

SPIROCHAETOSIS, BRONCHIAL.

The use of *Arsphenamine* advised (*p. 4*). (*See also* BRONCHIAL SPIROCHAETOSIS.)

SPLEEN, TUBERCULOSIS OF. (*See* TUBERCULOSIS OF SPLEEN.)

SPLENECTOMY. (*See ABDOMINAL SURGERY.*)**SPRUE.***Sir Leonard Rogers, M.D., F.R.S.*

ETIOLOGY.—W. W. Oliver¹ records a single case of sprue in which he cultivated yeasts which corresponded in the main to the *Monilia psilosis* described by Ashford.

TREATMENT.—P. Conran² records two cases treated in Scotland, in which a purely Meat Diet, as recommended by some authorities, proved of great service, progress towards recovery promptly following its use, although it requires some strength of mind on the part of the patient to stick to it.

L. Rogers³ records further experience of his method of treating sprue by **Autogenous Oral Streptococcal Vaccines** which he has now used in 44 cases. Among 20 cases followed up for over a year after completion of the injections, 18 remained well and may be considered cured, 1 was greatly improved, while 1 relapsed. Of 24 more recent cases, 3 remained well after less than a year had elapsed, 12 were greatly improved, 3 improved, 5 relapsed, and 1 died of independent cirrhosis of the liver after the sprue symptoms had disappeared. Among 45 cases treated by former methods at the European General Hospital in Calcutta, none were cured, 5 greatly improved, 8 improved (some of whom relapsed later), 26 showed no improvement, and 6 died: a great contrast with the results of the new method of treatment. The recoveries include one patient who came out from Great Britain to Calcutta in the hot weather for the treatment.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1920, i, 27; ²*Brit. Med. Jour.* 1920, ii, 206; ³*Med. Times*, 1920, 119.

SPUTUM, EXAMINATION OF.*O. C. Gruner, M.D.*

Greenfield and Anderson¹ describe a method of detection of tubercle bacilli in sputum by a sedimentation process: 5 c.c. of sputum are mixed with twice their volume of a mixture of cryst. sod. carb. 1 grm., cryst. carbolic acid 1 grm., and water 100 c.c., in a centrifuge tube; after shaking a few minutes, the tube is incubated for twenty-four hours; it is then centrifuged, and films are made from the deposit and examined in the usual way. The method is advocated specially for those who have to examine large numbers of sputa, and another advantage is that the material becomes sterilized by the process.

Salomon² gives a full account of the value of the *albumin test* for sputum as important evidence of tuberculosis. The reaction is always present in tuberculous cases. This observer was accustomed to give a patient 30 gr. of potassium iodide every day for several days, as well as an expectorant like sodium benzoate, before concluding that a negative result in the sputum was final evidence against the presence of tubercle bacilli. In this way he obtained still closer agreement between the bacillary findings and the chemical results. The test consists in adding an equal volume of distilled water to the perfectly fresh sputum; thorough trituration is done, a few drops of acetic acid are added to coagulate the mucus, and the filtrate is now treated with potassium ferrocyanide. One drop of solution suffices to give a turbidity. If there is any doubt about the reaction, it should be regarded as negative. The only cases in which tuberculous cases give a negative result are those in which there is advanced fibrosis. In chronic tuberculosis the reaction is invariably positive, whatever be the stage. It is invariably negative in chronic bronchitis of non-tuberculous origin. Should it become negative in a tuberculous case, this fact has a favourable significance, and the amount of precipitate obtainable also gives some indication of the severity of the morbid process.

REFERENCES.—¹*Lancet*, 1919, ii, 423; ²*Presse méd.* 1919, Sept. 18, 523.

STERILIZATION.*O. C. Gruner, M.D.*

Fenger, Cram, and Rudnick¹ find that there are certain organisms which can resist 150° C. present in most raw ligatures and sutures. They are not pathogenic. They can only be destroyed by gradual heating of the material in oil or some other suitable non-aqueous liquid for one hour.

REFERENCE.—*Jour. Amer. Med. Assoc.* 1920, Jan. 3, 23.

STOMACH CONTENTS, ANALYSIS OF. (*See GASTRIC ANALYSIS.*)**STOMACH, SURGERY OF.***James Sherren, F.R.C.S.*

The surgery of the stomach owes its inception and advancement to the work of many, but principally to English and American, surgeons. In dealing with an organ such as the stomach, the surgeon has had to feel his way, and by study of the results gradually improve his methods. It is only within a comparatively recent period that treatment has been placed on a sound basis, and even now there are points which are still unsettled.

As technique advanced, mechanical appliances were displaced in favour of suture with thread or silk, and these by absorbable sutures, at first for the inner layer, later for the outer, as the accumulation of knowledge obtained by watching cases over a number of years showed the disadvantages of each method.

The surgery of malignant disease of the stomach has advanced with knowledge of its spread gained at operation, and by the clinical and pathological investigations that have showed its relationship to chronic ulcer. Early treatment of this latter condition will diminish its incidence, and improved methods of operating have led to great improvement in prognosis.

In the last few years surgeons all over the world have become more radical in dealing with chronic gastric ulcer, and clinical experience has shown the type of case that needs treatment by partial gastrectomy.

One of the most striking facts brought out in recent years is the permanent healing of certain chronic ulcers after gastro-jejunostomy. The exact action of this operation is not even now beyond discussion. That its mechanical action alone is insufficient is, I believe, proved; the benefit derived from the operation is also bound up with what Paterson has called physiological, but are better termed chemical, changes. It should bring about a marked and permanent lowering of gastric acidity. This indirect method of operating is curative in the majority of cases of duodenal ulcer; and although it undoubtedly brings about permanent healing in many cases of chronic gastric ulcer, yet its failure in adherent, perforated ulcer, and the impossibility of diagnosing the early onset of malignant growth, have led many surgeons, including the writer, to treat certain of these cases radically, and they believe that the permanent results will be as satisfactory as the immediate. We must, however, look forward to the time when the cause of these disabling conditions will be known, and treatment can be undertaken before chronic ulceration or deformity has rendered interference with the anatomy and physiology of the organ necessary.

Simple Tumours of the Stomach.—These possess an interest far beyond that due to their rarity, on account of the difficulty of diagnosis, in many cases, from malignant tumours. The possibility of simple gastric tumours must always be borne in mind in discussing the advisability of exploration in advanced malignant disease.

Lemon¹ records an example of *angioma* from the Mayo clinic, giving a full account of the history, with references to five recorded cases. Bismuth *x*-ray examination revealed a filling defect in the body of the stomach which seemed

to confirm the clinical diagnosis of advanced carcinoma. W. S. Mayo was able to do a sleeve resection of 11 cm. of the body of the stomach; the patient made an uneventful recovery. The tumour was irregular in shape, bluish-black in colour, and of soft consistency, and measured 6 by 5 by 5 cm. It was situated beneath the mucosa. Microscopic examination proved it to be a capillary hæmangioma.

Adenoma is the commonest type of simple tumour of the stomach. Novak,² in reporting an example of the single polypoid type, reviews the subject briefly but adequately. Tumours of this type when situated near the pylorus may give rise to obstruction and suggest carcinoma.

The rarity of benign tumours of the stomach as surgical lesions is shown by the experience of the Mayo clinic. Balfour,³ in reporting an example of the multiple polypoid adenoma (*polyadenoma polypeux*—Menetrier), states that it was the first example of simple tumour found among 8000 abdominal sections for gastric lesions (*Plate XXXVI, A*). Bismuth *x*-ray examination in this case enabled a correct diagnosis to be made. It showed the characteristic mottled finger-print appearance (*Plate XXXVI, B*). This finding cannot, unfortunately, be relied upon. In two cases reported by Friedenwald and Finney,⁴ the diagnosis after bismuth *x*-ray examination was carcinoma. The same diagnosis was made in a case recorded by Du Bray,⁵ a simple tumour which to the naked eye resembled the one described by Balfour. The absence of free HCl, and the discovery on *x*-ray bismuth examination of a large clean-cut filling defect, led to the diagnosis of carcinoma. The correct diagnosis was made at operation, and local removal successfully carried out. These recent cases emphasize the importance of knowledge of these conditions.

Sarcoma of the Stomach.—Individual cases of this disease are reported from time to time. Koettlitz⁶ adds one to the list, and very briefly mentions the more important points connected with the condition. Douglas,⁷ in recording 3 cases which had been under his care, adequately reviews the subject, and brings the literature up to date. From a study of 230 recorded cases, he concludes that sarcoma occurs in 1 per cent of all stomach tumours, and that its age incidence is 41.6, lower than that of carcinoma. Round-celled and lympho-sarcoma are the most frequent forms found. These are usually infiltrating, but they may project into the stomach as pedunculated masses. Spindle-celled and myo-sarcoma are apt to form large exogastric tumours.

In the writer's experience this disease presents itself to the practitioner in two forms, corresponding to the exogastric and endogastric types into which Lecène and Petit,⁸ in one of the early contributions to the subject, divided them. In the former the symptoms are those of an abdominal tumour, often without any digestive complaint. They are more frequently found in women, and operation has been undertaken on the diagnosis of ovarian tumour. The tumour may reach a large size; in a case successfully removed by the writer⁹ it weighed 6½ lb.; since that date another of this type has been successfully operated upon.

In the other group the patient comes under observation on account of symptoms suggestive of carcinoma—there is usually nothing in the history, bismuth *x*-ray examination, or test meal that will enable the diagnosis to be made. Douglas states that in sarcoma free HCl is apt to be present in the gastric contents. In two of this type operated upon by the writer, free HCl was present, and in both total acidity increased. It must be pointed out, however, that cases of this nature are too few in number to enable a dogmatic statement to be made, and it is to be remembered that free HCl is by no means always absent in carcinoma of the stomach. The diagnosis in this group may be made at the time of operation by the appearance of the tumour,

PLATE XXXVI.

MULTIPLE POLYPOID ADENOMA

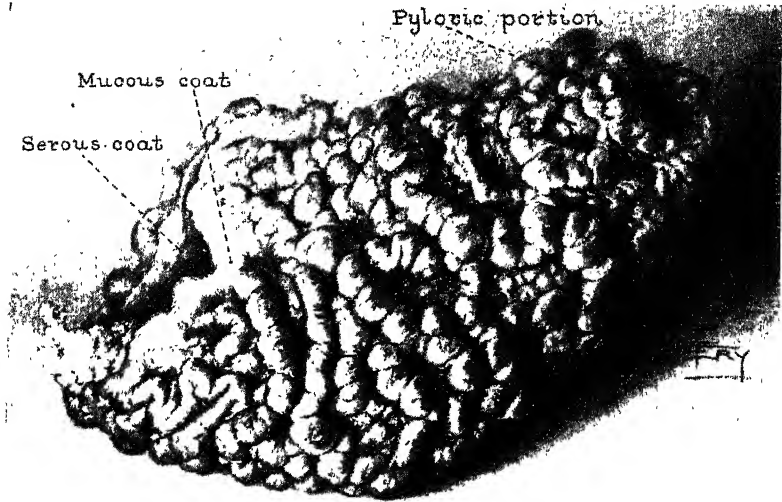


Fig. A.—View of the tumour.

Kindly lent by 'Surgery, Gynecology, and Obstetrics'



Fig. B.—Showing the appearance on barium x-ray examination.

Balfour.

PLATE XXXVII.

CONGENITAL HYPERTROPHIC PYLORIC STENOSIS

STRAUSS'S MODIFIED OPERATION

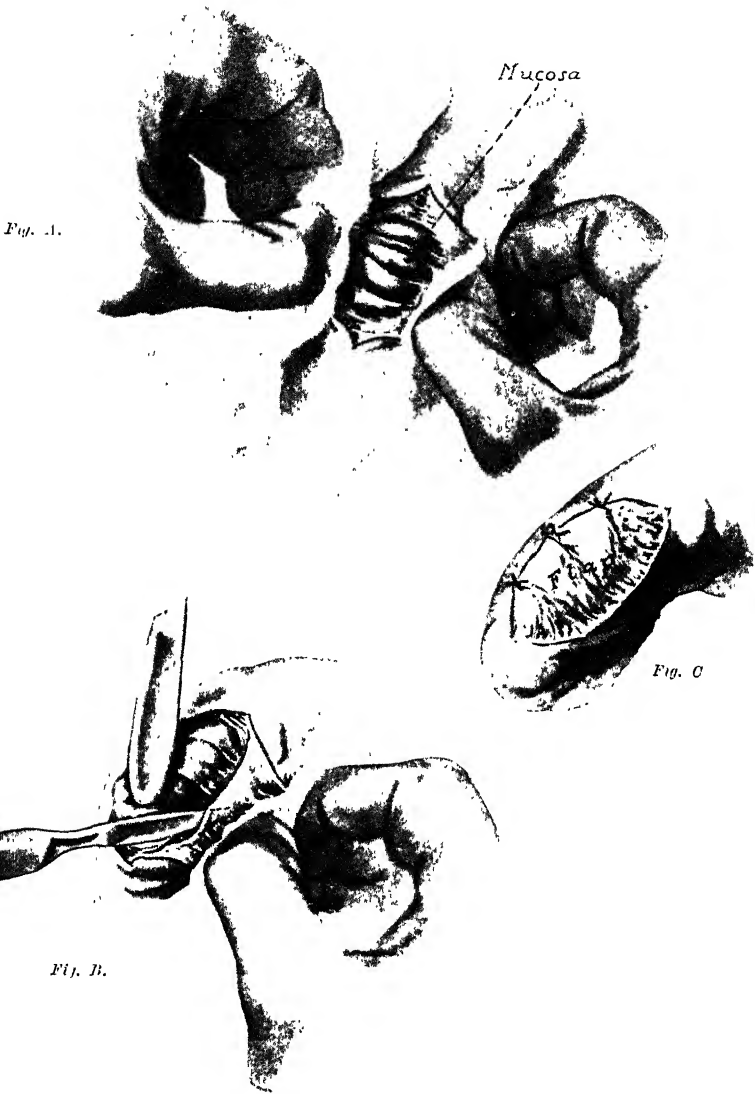


Fig. A.—Spreading the split tumour. Fig. B.—Bulging mucosa held on one side, knife making the flap. Fig. C.—Showing the muscular flap.

Redrawn by kind permission from 'Surgical Clinics of Chicago'

or, as in the writer's two cases, only on microscopic examination. One was treated by excision and gastrojejunostomy on the diagnosis of simple ulcer several years ago; the other by partial gastrectomy on the diagnosis of carcinoma nine months ago; both are alive and well, without sign of recurrence.

Carcinoma of the Stomach.—The relationship of chronic ulcer to carcinoma is most important; and its recognition should diminish the incidence of this disease. Considerable difference of opinion, however, exists with regard to it, writers varying in their estimate by as much as from 3 to 71 per cent. In a long paper Anchütz and Knojetzny¹⁰ discuss the matter clinically and pathologically. They review the question from the point of view of the patient's history; the after-development of carcinoma in cases of chronic ulcer treated by gastrojejunostomy; and examination of specimens of chronic gastric ulcer and carcinoma obtained at operation. They point out the mistakes that they consider may have invalidated previous figures on the clinical side; that a long history does not necessarily mean ulcer, and that some cases of carcinoma have long histories. On the pathological side, they discuss the question of ulceration in a carcinoma, and the mistaking of atypical gland-increase at the edges of the ulcer for growth. These fallacies are well recognized by other writers. They conclude that the question of how frequently carcinoma has its origin in ulcer is impossible to estimate, but that from 3 to 5 per cent of chronic ulcers later become carcinomatous. The writer believes that the latter figures are also impossible to estimate, as chronic gastric ulcer can only be certainly diagnosed by operation. The estimation of the proportion of carcinomata that originate in ulcers is doubtless at present impossible, but there is general agreement among surgeons that the number is large. C. H. Mayo¹¹ writes: "Chronic ulcer is the most important factor to be considered, as in well over 40 per cent there is a history of ulcer". Pauchet¹² estimates that 75 per cent originate in chronic ulcers.

In the writer's experience at least 50 per cent of the cases of carcinoma of the stomach give a history of over four years' duration sufficiently clear to have warranted operation for chronic gastric ulcer. Sir Berkeley Moynihan¹³ states that "in more than half the cases of carcinoma of the stomach there is a history suggestive of the previous existence and of the recurrence of a gastric ulcer. In about 25 to 30 per cent of the cases of carcinoma of the stomach removed by operation the claim that the malignant change is imposed upon a simple one appears on pathological grounds to be irrefutable". He also states that, in not less than 10 per cent of cases of gastric ulcer to all appearance simple, a microscopic examination of the specimen removed at operation shows the early stage of carcinoma. The writer's figures closely agree. To the end of 1919,¹⁴ in 14 out of 57 specimens of carcinoma of the stomach removed at operation there was definite microscopic evidence that the malignant disease started in a simple ulcer. Among 135 ulcers removed on the diagnosis of simple ulcer during this period, carcinoma was discovered starting in the edge of the ulcer in 6.

There can be no doubt from the evidence that has accumulated, that chronic ulcer is the one known factor in the etiology of gastric carcinoma, and that work in the direction of the prevention and cure of this condition will lower the incidence of the disease.

The positive diagnosis of carcinoma of the stomach is a late diagnosis; operation must be undertaken *on the probability* after the most thorough investigation. X-ray examination is becoming more accurate, and in some clinics a very large percentage of cases of carcinoma give positive findings. Carman and Miller¹⁵ write that, in the Mayo clinic, 95 per cent of gastric cancers have given distinct röntgenological signs of their presence. C. H. Mayo

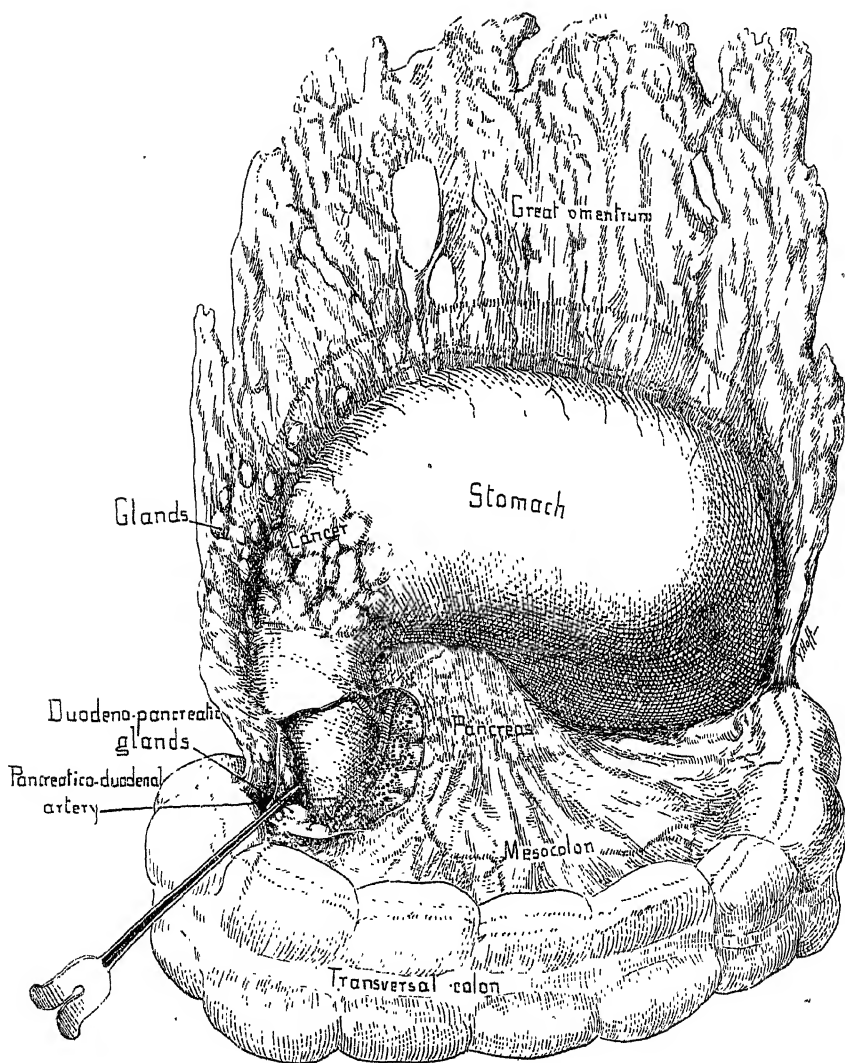


Fig. 53.—The lesser sac has been opened through the omental colic separation to explore the posterior surface of the stomach and duodenum. The great omentum is thrown upwards, and its avascular attachment to the anterior surface of the colon has been freed by a knife; this dissection was begun as far as possible towards the left. The posterior relations of the stomach are fully displayed. The tumour and glands are separated from the transverse mesocolon and pancreas; the pancreatico-duodenal artery is defined and ligatured. This stage is performed by guze dissection, the director, or bistoury, and includes also the freeing of the middle colic vessels in the transverse mesocolon and separation of the glands, all of which should remain attached to the stomach. Dotted lines on the pancreas show the situation of the glands removed.

(Illustration prepared in France. Kindly lent by 'The Lancet')

states "at a time when the cancer syndrome is not positive but probable, the x ray may be relied on to demonstrate lesions of the stomach in more than 95 per cent of the cases". The writer would urge caution in translating these results, obtained under exceptional conditions, into practice in this country. He has known operation delayed on account of a negative x -ray finding, and also because the condition was supposed to be inoperable as revealed on x -ray examination. Neither this method of examination nor the result of a test meal, although both should be done, should permit delay when the history suggests carcinoma; nor should presumably unfavourable appearances on the x -ray examination withhold from the patient his chance of operative relief.

(For further discussion of x -ray diagnosis see p. 25.)

TREATMENT.—With regard to operative treatment, partial gastrectomy, with direct union of the cut end of the stomach to the side of the jejunum, seems now to be the operation of choice. Details differ with each surgeon, and must vary with each case. In some it is possible to do a satisfactory trans-mesocolic operation, fixing the opening in the mesocolon to the remains of the stomach; in others, and these are the majority, the jejunum lies best if brought to the stomach in front of the colon. C. H. Mayo,¹⁶ in cases in which the cut end of the stomach is more than three inches in length, partially closes the stomach. The writer has not found this necessary: it would in his hands add to the length of the operation, a serious consideration in patients with carcinoma. Pauchet removes the whole of the great omentum attached to the stomach (*Fig. 53*). The writer, while using this method of separation of the great omentum from the transverse colon for exploratory purposes and in colectomies, considers that it is unnecessary in partial gastrectomy.

The results of gastrectomy are steadily improving, and the immediate mortality should not exceed 10 per cent. The operability of the cases sent for surgical treatment gives great room for improvement, and it is only by widespread knowledge of the need for early skilled investigation in digestive disorders that improvements will come. At present removal is not possible in more than a third of those operated on.

With regard to the ultimate result, in the Mayo clinic 37.6 per cent of three-year cures and 25 per cent of five-year cures have been obtained. The total number of resections was 736, with a mortality of 13.7. These figures include the early cases, and will show greater improvement. Pauchet,¹⁷ in speaking of the results obtained in 300 cases of resection, says that pessimism with regard to gastrectomy for carcinoma is unjustifiable; with these words the writer is in full agreement.

Carcinoma of the Duodenum.—In comparison with carcinoma of the stomach this is an exceedingly rare disease, notwithstanding the fact that chronic ulcer of the duodenum is more common than similar disease of the stomach.

In the writer's Hunterian Lecture¹⁸ he records 9 cases personally treated by operation. In 6 the disease attacked the second part of the duodenum, and in only one was it met with in the first portion in the situation in which ulcer is commonly encountered. No instance of the development of carcinoma from simple ulcer has come under the writer's care. The great rarity of this condition is evidenced by the fact that Jefferson,¹⁹ in reporting a case in which he considered the complication followed a simple ulcer, was only able to discover thirty others in which this suggestion arose; but he points out that "several of these cases are very doubtful". The writer is of the opinion that in less than half is the evidence sufficient to justify the belief that malignancy was secondary to simple ulceration.

Deaver and Ravdin²⁰ record an example of carcinoma of the second part, and in a general survey of the disease they quote combined figures of collected cases showing the relative frequency with which the second part of the duodenum is involved.

Volvulus of the Stomach.—The rarity of this condition will be realized from the fact that no case has been admitted to the London Hospital in the last twenty years. In 1911 the writer²¹ was able to collect 20 cases, 14 of which were treated by operation, with 8 recoveries. Very little has appeared since to add to our knowledge. Kerr,²² in recording a case of the so-called idiopathic variety—in which no other pathological lesion of the stomach is found—reviewed the literature and found eight others, of which he gives a summary. Gastropptosis is undoubtedly necessary for its causation. Knaggs²³ reported its occurrence as a complication of diaphragmatic hernia. Payer²⁴ regarded this as one of the causes. Another example in association with this condition is recorded by Dubs.²⁵ The most recent contribution to the subject is by F. Niosi,²⁶ in which he records two further personal cases treated by operation, one of which was 'idiopathic', the other complicated by an hour-glass stomach.

DIAGNOSIS.—If the existence of the condition is remembered, its diagnosis should give rise to little difficulty. The sudden onset of epigastric pain, usually associated with retching, and the development of a tense resonant swelling in the left upper abdomen, are characteristic.

TREATMENT.—This should be operative—immediate laparotomy with reduction of the volvulus; this may necessitate puncture of the tense stomach before it can be accomplished. The passage of a stomach tube in the 'idiopathic' variety is usually impossible; but where the pyloric sac of an hour-glass stomach is involved and the torsion incomplete it may be possible, as in Niosi's second case. The acute symptoms were alleviated and operation for the hour-glass stomach carried out later. In the 'idiopathic' variety Niosi recommends gastro-enterostomy, to prevent overfilling and to anchor the stomach. The writer believes that this should not be done; these patients are the subjects of gastropptosis; gastrojejunostomy, if performed, is liable to be followed by discomfort and vomiting. If the condition of the patient will admit, gastropexy should be performed. When volvulus occurs as a complication of hour-glass stomach, the appropriate treatment for this condition should be carried out, if possible, after reduction of the volvulus.

Phlegmonous Gastritis.—Little has been written on this subject in the past ten years. In 1910, J. E. Adams,²⁷ in recording a case due to infection with the pneumococcus, brought the whole subject under review. The first accurate account of this disease in the English language was that of Leidl,²⁸ who in 1910 wrote the article on the subject in Allbutt and Rolleston's *System of Medicine*, when he was able to collect 100 cases. In recent papers, Sundberg²⁹ gives details of 17 cases from the clinics of Stockholm and Upsala, which with the recorded cases brought the numbers up to 215. Novak³⁰ records a case of the circumscribed variety of submucous abscess of stomach successfully treated by resection of the stomach. A brief but satisfactory review of the disease follows.

Although of extreme rarity, it is a condition of importance to the surgeon. The disease is a purulent infection of the submucous coat of the stomach, and may be diffuse or localized, about 20 per cent of the cases being the latter, and possibly amenable to surgical treatment. All writers are agreed that males are affected at least three times as often as females. The infecting organism is usually a streptococcus, but mixed infection with the colon bacillus is not uncommon.

Epigastric pain is the most prominent symptom, with rigidity, tenderness,

and temperature. If, as is usual in the circumscribed variety, the pyloric portion of the stomach is involved, the rigidity and tenderness in the right upper abdomen accounts for the pre-operative diagnosis of cholecystitis in a few cases. Its sudden onset may suggest perforation of a peptic ulcer. Vomiting is an almost constant feature; pus has been found in the vomit, but is rare. Prognosis is grave and recovery doubtful in the diffuse variety. In the circumscribed, it is possible that rupture of the abscess into the stomach cavity may lead to spontaneous recovery. Resection of the affected portion of the stomach should lighten the outlook in the circumscribed variety, and it is this aspect of the disease that is of practical interest to the surgeon.

Congenital Hypertrophic Pyloric Stenosis.—The recognition of this disease is now becoming more general, and the indications for operation are being standardized. A new era in its treatment has dawned since the adoption of Rammstedt's³¹ procedure of simple division of the hypertrophic muscle, leaving the mucous membrane intact, thus simplifying Fredet's³² and Weber's³³ operations, in which the gastric incision was sutured transversely.

The mortality in this country has up to the present been high. Warren³⁴ states that, in 30 cases treated medically at the East London Hospital for Children, all died except one, and in this case the diagnosis was in doubt. (From a personal communication I find these were in the eight years from 1909 to 1917.) At Great Ormond Street,³⁵ during the years 1915-16-17, 54 cases were admitted: the total mortality was 80.5 per cent, the operative 100 per cent.

ETIOLOGY.—It seems probable that the condition is present at birth. Its actual causation is unknown. Strauss³⁶ suggests that the condition is brought about by rhythmic contractions of the pylorus due to abnormal stimulation, accentuated after birth by the additional irritation produced by taking food. Tyrrell Gray and Pirie,³⁷ in an exhaustive paper, come to the conclusion that congenital pyloric hypertrophy is the result of prolonged antenatal spasm induced by hyper-adrenalism, and that the obstruction is complicated by (1) retention gastritis with consequent swelling of the mucosa, and (2) added spasm due to several causes—foremost by phimosi. Considerable stress is laid upon phimosi being the determining factor in the onset and severity of symptoms in the male. Further observations are necessary before these conclusions can be established.

DIAGNOSIS.—The diagnosis is made certain by the detection of a palpable tumour. Warren writes, "The diagnosis practically turns on one point, the presence of the little hard acorn-like tumour". Gray and Pirie say, "It is the one certain sign". The suggestive symptom that leads to palpation for this sign is projectile vomiting. Visible gastric peristalsis is valuable as showing obstruction; Downes considers it of the greatest diagnostic value. Strauss also regards this, followed by projectile vomiting, as making the diagnosis almost certain. He continues: "Fluoroscopic examination is the most important means of making an accurate diagnosis. It not only shows whether or not the case is one of pyloric stenosis, but decides for us immediately whether the patient should receive medical or surgical treatment. In 156 cases, 101 were classified as surgical in this way, and in each instance the typical tumour was found at operation. Of those classified as medical, none required surgical treatment". If from 70 to 80 per cent of the bismuth goes through within four hours, he states that there will be recovery under medical treatment, irrespective of any clinical symptoms or tumour. If less than 70 per cent passes through, it is an indication for operation.

In considering diagnosis, the writer can confirm the value of x-ray bismuth examination in doubtful cases. He considers that if the signs of projectile

vomiting, visible peristalsis, and palpable tumour are all present, operation should be carried out whatever the condition of the child. Circumcision if necessary, followed by medical treatment, may be tried if the condition of the child is good, but not for longer than a week or ten days. It must, however, be remembered that evidence is accumulating to suggest that the cases not needing operation in infancy may do so in later life.

TREATMENT.—It is now recognized that Rammstedt's operation or some modification is the ideal surgical procedure. Surgeons have recognized its dangers, and modified their technique accordingly. All recent writers with experience of dealing with this condition emphasize the necessity for blunt dissection through the tumour mass of muscle and the mobilization of mucous membrane to allow it to protrude freely. These modifications are essential

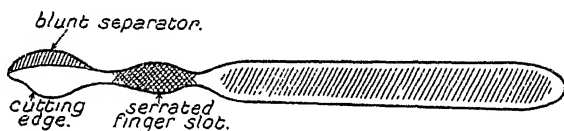


Fig. 54.—Tyrrell Gray's knife and separator for operation in congenital hypertrophic pyloric stenosis.

to the complete success of the operation: blunt dissection avoids the danger of opening the duodenum, wide separation of mucosa that of recurrent vomiting, for which patients have been re-operated. Tyrrell Gray uses a special knife with a blunt separator (Fig. 54) for the purpose. Downes³⁸ separates the muscle fibres with artery forceps so as to permit the mucous membrane

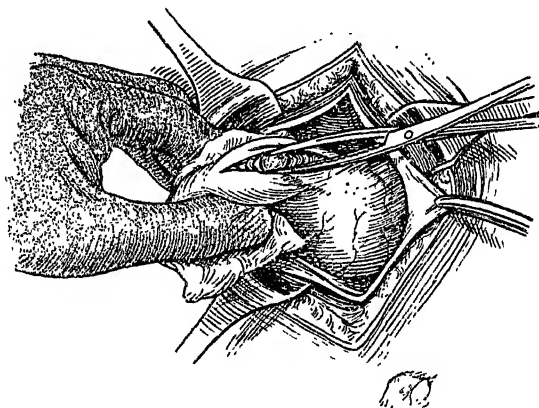


Fig. 55.—Incision spread with artery clamps; mucosa beginning to appear between divided muscle fibres.

Figs. 55 and 56 are redrawn from the 'Journal of the American Medical Association.'

to protrude freely (Figs. 55, 56). Strauss lays great stress on these points, but differs in concluding the operation by forming a muscular flap (Plate XXXVII) which is sutured over the protruded mucous membrane. The writer cannot believe that this latter is necessary; it must add to the time consumed, a very important factor, and post-mortem investigations have shown that at

eighteen months (Downes) and at six months (Ransohoff) after operation all tumour has disappeared—the pylorus appears normal.

The death-rate of this operation is rapidly falling. Strauss reports 107 cases with 3 deaths. These were not selected cases; he states: "In none of the cases which came to us was operation refused; 32 were in a moribund condition". Downes gives 175 with 30 deaths, a mortality of 17.1 per cent; this includes all deaths in hospital, some of which occurred from two to four weeks after operation; 18 died within seventy-two hours. The mortality of those coming to operation within four weeks of the onset of symptoms was less than

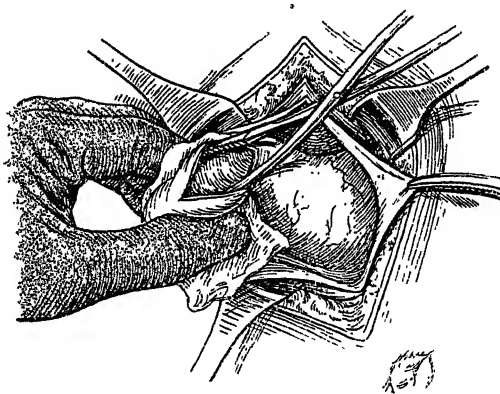


Fig. 56.—Mucosa protruding freely between cut edges of muscle; operation completed.

8 per cent. At Great Ormond Street, Tyrrell Gray performed Rammstedt's operation on 17 occasions, with 7 deaths, a mortality of 14.1 per cent. In Gray and Pirie's paper they estimate the mortality in early cases as 9 per cent. These figures of individual operators show that the disease is either more frequently met with in New York and Chicago, or more often diagnosed and recognized as surgical.

The care necessary in post-operative treatment cannot be too often emphasized. Details vary with each writer; but small feeds should be given, breast or peptonized milk, commencing an hour after operation and repeated every two hours, and the amount gradually increased so that from the fifth to the eighth day normal quantities are being taken. Rectal infusion of saline is preferable to subcutaneous. It should be given with or without glucose, an ounce at a time; at first three-hourly, the frequency being reduced later as more fluid is taken by the mouth. Warren reminds us of an important fact, that we must not be too much guided by rule, as he speaks of the after-treatment as "a problem in feeding to be tried in each case separately".

Gastrojejunostomy.—This operation has passed through many phases since the anterior long-loop operation was first performed by Wölfer in 1881. Several stages can be recognized as increased confidence indicated improved methods of union, and mechanical and ulcerative complications brought about the abandonment of anterior in favour of posterior, and the long-loop in favour of the no-loop, operation. The enthusiasm with which its early results were received led, as so often happens, to its employment in altogether unsuitable cases, with the result that only recently are its limitations becoming recognized.

The past year has emphasized this knowledge. That the operation is not

even now standardized is shown by the opinions expressed at the recent discussion at the Royal Society of Medicine³⁰, introduced by Paterson, on the remote results of the surgical treatment of gastric and duodenal ulcers. Its success in the treatment of chronic duodenal ulcer was admitted by all, but its exact place in that of chronic gastric ulcer was debated (*see* GASTRIC ULCER). Most were agreed that the use of unabsorbable suture material is unnecessary and inadvisable; it is still, however, used by some who are not convinced that it is the cause of gastrojejunal ulcer. W. G. Spencer opposed "most strongly the recommendation that gastrojejunostomy should not be done if the surgeon can find no definite ulceration". This is in direct opposition to the teaching of those with the largest experience in this branch of surgery: in their opinion gastrojejunostomy is unjustifiable in the absence of a definite lesion.

Gore Gillon,⁴⁰ under the title 'A New Pylorus', advocates a return to posterior gastrojejunostomy with jejunojejunostomy, an operation which was a stage in the evolution of the correct no-loop operation. Gillon based his claim for the operation on the assumption that "the long series of complaints noted by physicians are entirely and wholly due to this unnatural result of the conventional operation" (the bile and pancreatic juice finding their way into the stomach). That the presence of bile and pancreatic juice in the stomach produces no ill effect was first shown by Moynihan⁴¹ in recording a case of ruptured duodenum treated so that all these fluids passed through the stomach. Cholecystogastrostomy is a relatively common operation, and the writer has on several occasions completely divided the jejunum and implanted the ends separately into the stomach, thus assuring that all the bile and pancreatic juice must pass through, without any gastric inconvenience resulting.

Intestinal obstruction following gastrojejunostomy is an extremely rare complication, and was first recorded as being due to internal hernia of the small intestine through the opening in the transverse mesocolon. Suturing the edges of the opening has abolished this, the most common, cause. Bryan⁴² records a case of recurrent internal hernia in which small intestine had passed behind the anastomosis from right to left. At the first operation, twelve days after the gastrojejunostomy, reduction was carried out. Six days later recurrence necessitated another operation; jejunojejunostomy was done, and the descending loop sutured to the abdominal wall. Ten months later the patient was in excellent health. Warren⁴³ records a case due to a retrograde intussusception of jejunum through a gastrojejunostomy stoma thirteen years after the operation. Reduction was effected without difficulty, but the patient succumbed to bronchopneumonia on the tenth day. Post-mortem examination showed recovery of the affected intestine, and revealed nothing which shed light on the causation of this interesting complication.

From time to time there have been misgivings in the minds of surgeons as to the use of the clamp. It has been blamed, justly in the writer's belief, for certain cases of post-operative hemorrhage. The most recent communication on the subject is from Sir John O'Connor,⁴⁴ who, in an interesting letter on gastro-enterostomy, again draws attention to it. The writer has known no harm to follow the use of a clamp on the stomach if it is loosened after the posterior inner row of sutures are inserted. He believes a jejunal clamp to be a cause of jejunal ulcer in certain cases. (*See* JEJUNAL AND GASTROJEJUNAL ULCERATION.)

Jejunal and Gastrojejunal Ulceration.—These are conditions which still exercise the minds of surgeons. General agreement is being reached with regard to the principal agents in their production. All recent communications lay stress on hyperacidity, and most on the influence of non-absorbable suture material. The association of this condition with chronic duodenal ulcer in

men, and with excessive gastric acidity, is striking. In the writer's⁴⁵ operative experience of 32 cases, in 28 it followed gastrojejunostomy performed for duodenal ulcer; only two of the patients were women, and in neither was it of the true jejunal type.

The division of these ulcers into jejunal and gastrojejunal, first advocated by Paterson, is of the utmost importance. In the writer's Hunterian Lecture, he concludes that the former is probably due to persisting hyperacidity, with (*a*) failure to discover the original cause of the ulcer, a fresh infection originating an ulcer at the new opening, or (*b*) the vitality of the intestine is mechanically lowered by bruising from clamps; while the latter is usually due to the use of unabsorbable suture material. At the discussion on the remote effects of the surgical treatment of gastric and duodenal ulcers at the Royal Society of Medicine, Walton and Garnett Wright expressed the same opinion with regard to gastrojejunal ulceration. Paterson⁴⁶ regarded this method of origin as 'not proven'.

The writer has pointed out that the situation of the gastrojejunostomy opening influences the degree of post-operative lowering of acidity. The nearer the pylorus the anastomosis is made, the less the reduction. Pauchet⁴⁷ confirms these views in a paper on post-operative jejunal ulcer. He lays stress on hyperacidity, which was present in all his 11 cases, and mentions that for the purpose of producing the greatest post-operative lowering of acidity he makes the anastomosis as far from the pylorus as possible. In one of his cases clamp pressure was a factor. In 5 out of 7 gastrojejunal ulcers, portions of non-absorbable material which had been used for the sero-serous suture were found.

A discussion on the subject at the Surgical Section of the American Medical Association in April, 1920, was opened by Terry.⁴⁸ He laid stress on the action of the gastric juice: "It is my belief that the principal factor in the production of these ulcers is the introduction into the jejunum of non-neutralized acid gastric juice, and that trauma, be it from the light application of clamps, injuries of blood-vessels, or retained sutures, further lowers the resistance of the jejunum or of the anastomotic opening to the digestive action of the gastric juice". In the discussion that followed, W. S. Mayo, Shelton Horsley, and Strauss all mentioned the rôle played by unabsorbable sutures. A. S. Ochsner doubted their action. Strauss alone questioned whether the acid gastric juice played any part in the production of these ulcers, but favoured infection as the cause.

Kummell⁴⁹ introduced a discussion on the subject at the North-West German Surgical Association in December, 1919. He pointed out that secondary ulceration most often follows gastro-enterostomy when performed for duodenal ulcer, and refers to the rôle played by gastric acidity. He comments on the frequency of secondary ulceration when gastrojejunostomy is combined with pyloric exclusion by the method of Von Eiselsberg. (In 1914 Von Eiselsberg⁵⁰ himself stated: "Whether, as it really seems, post-operative peptic ulcer appears more readily after pyloric exclusion is not yet certain.") The writer believes that pyloric exclusion in duodenal ulcer with a high gastric acidity is a contributory cause of true jejunal ulcer. The cases in which there was no definite evidence of clamp pressure all arose after operations performed during the time in which he carried this out. At the succeeding discussion, jejunal and gastrojejunal ulcers were not separated, and no mention was made of the nature of the suture material. The percentage of cases in the experience of the various speakers varied from 2.1 per cent (Rostock clinics) to 8 per cent (Schmilinsky, Hamburg). No new light was shed on the subject by this discussion.

The greatest percentage of cases recorded is that by Macdonald and Mackay,⁵¹ who, from a study of 330 cases, concluded that gastrojejunal ulcer followed in, at least 30 per cent of gastrojejunostomies.

TREATMENT.—The treatment of jejunal ulcer remains in the experimental stage so long as its cause is uncertain. In every case thorough medical treatment should be tried. Failing cure by this means, in cases of gastrojejunal ulceration due to unabsorbable suture the treatment is simple—excision of the ulcer with removal of the offending suture, and re-forming the anastomosis if it is necessary. It cannot be said that the best method of treatment for jejunal ulcer has been worked out, but the writer believes that a method which permanently lowers gastric acidity is necessary. For this purpose he has excised the anastomosis and implanted both ends of the jejunum separately into the stomach.

A characteristic feature of true jejunal ulcer is its penetrating tendency. When arising after the usual posterior gastrojejunostomy, the floor of the ulcer is often formed by the colon, and perforation, with the formation of a jejunocolic fistula, is a common complication. Among 13 jejunal ulcers under the writer's care, 5 had perforated into the colon. He was able to operate on 4: one died within twenty-four hours; the remainder have been quite well three years after the second operation, which in each case consisted of excising the anastomosis close to the opening into the colon, with implantation of both ends of the jejunum into the stomach.

Bolton and Trotter⁵² have published an exhaustive study of this condition, based on 5 cases that had been under their care, 3 of which were operated upon successfully by the latter. The paper reviews the previously published cases, and gives a full account of the symptoms, diagnosis, and prognosis. While no new facts are stated, it solidifies our knowledge and brings it up to date. The operation advocated by Trotter, "obliteration of the fistula without interference with the gastrojejunal anastomosis", is not, in the writer's opinion, the best procedure. Jejunal ulcer is liable to recur, and if it is at all possible the whole anastomosis should be excised and both ends of the jejunum implanted into the stomach, thus ensuring permanent lowering of gastric acidity.

Chronic Gastric Ulcer.

ETIOLOGY.—The knowledge that acute ulceration of the stomach and duodenum is the result of the gastric juice acting on cells of lowered vitality we owe in large measure to Bolton, whose experimental and clinical work is embodied in his book on *Gastric Ulcer*.⁵³ Nothing that has since been done has altered the conclusion at which he arrives. Bolton believes that the acute is the precursor of the chronic ulcer. The reason why some acute ulcers become transformed into the chronic variety is not definitely known, nor is the cause of the greater frequency with which chronic ulcer is found in the male sex.

Reeves,⁵⁴ in a study of the arteries supplying the stomach and duodenum and their relation to ulcer, found that the arrangement of the arteries along the lesser curvature of the stomach and the first inch of the duodenum is such that they are predisposed to thrombosis: the plexus of vessels in the submucosa of these regions is made up of smaller, longer arteries than elsewhere, and the branches run a very tortuous course to enter the mucosa. This arrangement may be one of the determining causes of localization of a chronic ulcer, 90 per cent of which are on the lesser curvature or in the first part of the duodenum. In these regions also, as C. H. Miller⁵⁵ and more recently Lansdown and Williamson⁵⁶ have pointed out, lymph follicles are most numerous.

Hurst⁵⁷ in a suggestive paper comes to the conclusion that there is one type of stomach (the hypotonic) in which a gastric ulcer may develop, and another (the hypertonic) found in patients in whom, if the necessary exciting causes are present, a duodenal ulcer is produced. This is the most satisfactory explanation that has been given for the localization of these ulcers. In the writer's opinion, hypertonic stomach is much more common in men, and would account for the greater frequency with which duodenal ulcer is found in this sex.

DIAGNOSIS.—Accurate diagnosis is much more difficult than in chronic duodenal ulcer, and *definite* diagnosis is at present impossible unless direct evidence is obtained by bismuth *x*-ray investigation. In Moynihan's⁵⁸ clinic a diagnosis is made in this way in 90 per cent of the cases. Here the writer would give warning that a negative result should not contra-indicate operation in those cases in which periodical attacks of pain at regular intervals after food, separated by periods of digestive health, strongly suggest the presence of chronic ulcer. (*See also CARCINOMA OF THE STOMACH.*)

TREATMENT.—With regard to treatment, a change is taking place among surgeons as to the necessity in many cases for a direct attack upon the ulcer. Seven years ago the writer stated:⁵⁹ "Simple chronic gastric ulcers, wherever situated, will heal as the result of gastrojejunostomy correctly performed, unless they are adherent and have perforated, their floor being formed of pancreas or liver". He is still of this opinion, and in his Hunterian Lectures gives evidence obtained post mortem in 9 patients two to nine years, and in 13 patients at second operations from fourteen days to seven years, after gastrojejunostomy alone: the ulcer had healed in all. Owing to failure of gastrojejunostomy to cure ulcers of the types mentioned above, and to the impossibility of being certain that an indurated ulcer is simple, all ulcers with a suspicion of malignancy, and all of the former type, are treated by partial gastrectomy. Paterson⁶⁰ almost alone upholds gastrojejunostomy as the operation of choice in all cases. He states that he had the opportunity of investigating the healing of ulcers post mortem on 16 occasions: in all of them the ulcer, whether gastric or duodenal, had healed.

Moynihan,⁶¹ on opening the discussion on the subject at the Surgical Section of the British Medical Association, after reviewing the methods at our disposal, stated: "My choice of operation now always falls upon partial gastrectomy whenever it can with reasonable safety be performed". In the ensuing discussion, Charles H. Mayo reviewed operations for chronic gastric ulcer on 638 patients at the Mayo clinic in the five years before July 1, 1919, and pointed out, what is now generally recognized, that chronic gastric ulcer is a much more serious disease than chronic duodenal ulcer. He adds that they should be destroyed at the time of operation unless it would add unwarranted immediate risk. He describes methods in use at the clinic, the Balfour cautery method and the operation for removal of posterior perforating ulcers through the gastrohepatic omentum recently described by W. S. Mayo;⁶² in both the operation is completed by gastrojejunostomy. In extensive ulceration partial gastrectomy is carried out.

Urrutia⁶³ recommends partial gastrectomy as the operation of choice. Abadie⁶⁴ also prefers partial gastrectomy to gastro-enterostomy. Pauchet⁶⁵ deals directly with the ulcer by Balfour's method, or in callous ulcer carries out partial gastrectomy.

With changing methods it is difficult to give an exact account of results. The writer found that 75 per cent of the patients operated upon prior to December, 1917, were well two years later, 80 per cent of those that could be traced. Paterson, taking gastric and duodenal ulcer together, found a percentage of 80 could be regarded as cured, and a further 9 per cent relieved.

Walton⁶⁶ in his cases found 80 per cent complete recoveries. This figure therefore may be taken as about accurate at the present time. The adoption of partial gastrectomy in suitable cases, the writer believes, will still further improve the figures.

Hour-glass or bilocular stomach is a complication of chronic ulcer met with almost entirely in women. Of 80 cases operated upon by the writer to December, 1919, all except 7 were in women. Walton⁶⁷ has devised a method of dealing with this condition by excising the ulcer together with a considerable extent of the lesser curvature, restoring the shape of the stomach, and performing gastrojejunostomy and pyloric exclusion (*Plate XXXVIII*). In few of the hour-glass stomachs that have come under the writer's care would this operation have been possible. In most the ulcer was perforated and adherent to the pancreas or liver, and only satisfactorily treated by partial gastrectomy. In 49 out of the 80 cases this had to be done.

At the Mayo clinic 89 operations were performed for hour-glass stomach, with a death-rate of 7.4 per cent. The operation now performed there is sleeve resection, usually combined with gastrojejunostomy.

Pauchet,⁶⁸ writing from an experience of 25 cases, in 18 of which he carried out partial gastrectomy, states that these extensive resections give the best results.

The writer's⁶⁹ results are as follows: Partial gastrectomy—49 cases, 3 deaths; single gastrojejunostomy—26 cases, 1 death; double gastrojejunostomy (in cases associated with pyloric stenosis from duodenal ulcer)—5 cases. He believes that the condition should be treated on exactly the same lines as chronic ulcer without this complication. All cases operated on over two years are quite well with one exception, and in this patient the complaint is of occasional discomfort only.

Duodenal Ulcer.—Although the first cases of chronic duodenal ulcer were operated upon by Codivilla in 1893 and 1898, and the first successful closure of a perforation was carried out by H. P. Dean in 1893, it is only in the last fifteen years that its surgical treatment has been systematically undertaken. The earliest complete account of the symptoms was given in 1905 by Sir Berkeley Moynihan,⁷⁰ to whose work on the subject so much of our knowledge is due. Little can be added even now to this account. The belief that peptic ulceration is secondary to infection from a distance has led to a recognition of the necessity for dealing with possible sources of infection in the abdomen and elsewhere as well as performing gastrojejunostomy.

Evidence as to the widespread distribution of the disease accumulates. It is common in all European countries and on the American continent. Pugh⁷¹ records cases operated upon in Travancore, and remarks upon the number of patients suffering from gross disease of the stomach and duodenum in Southern India. He quotes from an article by C. C. Elliott⁷² recording a number of cases from a district in China.

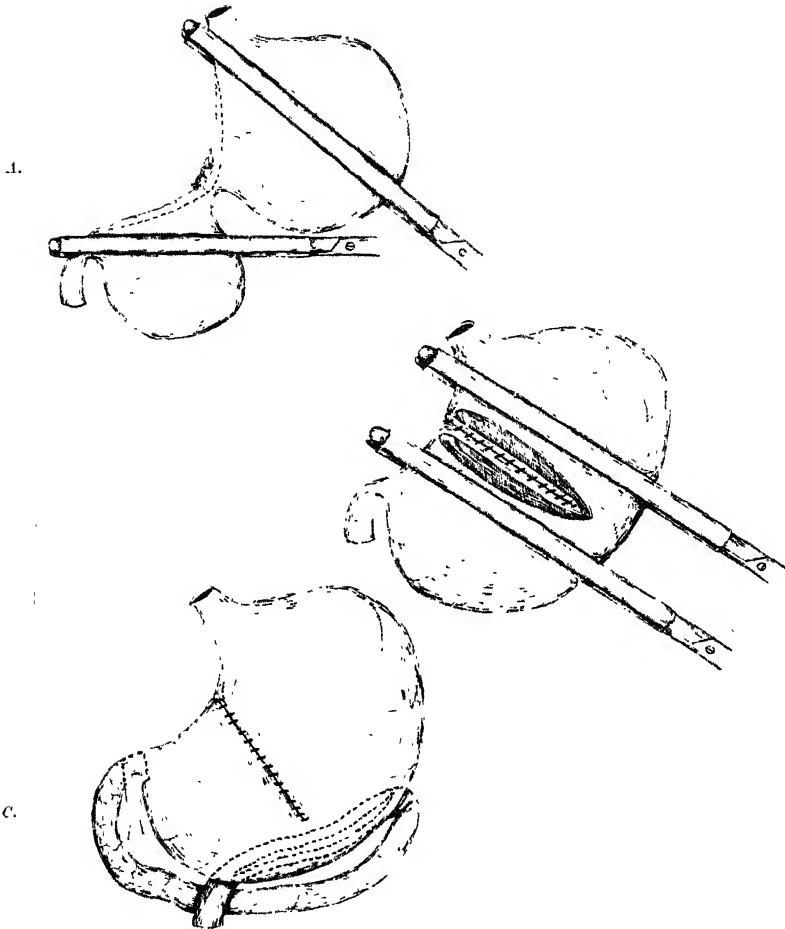
There is general agreement that the immediate result of surgical treatment is good; the remote result challenges comparison with that of any major operation. Various surgeons are closely in accord in their statistics of cures: W. J. Mayo,⁷³ 98 per cent cured or greatly relieved; Moynihan,⁷⁴ 82 per cent; Paterson,⁷⁵ 80 per cent; Sherren,⁷⁶ 80 per cent of those operated upon (this understates the percentage, as it counts those who could not be traced, or died of other causes, as failures. The writer believes the rate of cure to be at least 90 per cent).

The Actuarial Society of America followed up the records of cases operated upon in the Mayo clinic between the years 1906 and 1915 with regard to the expectation of life after operation. Balfour⁷⁷ publishes these figures. As

PLATE XXXVIII.

TREATMENT OF HOUR-GLASS STOMACH

(WALTON'S METHOD)



A.—Clamps placed obliquely across the stomach. The amount of the stomach wall to be excised is indicated by the dotted lines. B.—Clamps placed parallel to one another. Suture of stomach opening commenced. The posterior seromuscular layer of sutures has been passed. C.—Opening in stomach completely closed. Posterior gastro-entero-stomy with horizontal opening performed. Silk suture passed ready to occlude pylorus but not tied.

Kindly lent by 'Surgery, Gynecology, and Obstetrics'

compared with the general population of similar age and sex, the mortality in the first two years is not more, and in succeeding years is actually less.

It may be taken as a conservative estimate that 90 per cent of the cases of chronic duodenal ulcer that have failed to be cured by medical means can be cured by surgical measures. The failures, though few in number, indicate that the causation of this condition is not yet completely known, and that, when technique is good, recurrence of symptoms due to the development of a jejunal ulcer depends on our failure to discover the cause of the original ulcer.

That the cure of the ulcer is dependent on the success of the operation in diminishing gastric acidity is, I believe, certain. Hurst,⁷⁸ in a recent paper, puts forward the theory that the hypertonic type of stomach found with duodenal ulcer is present before the ulcer, and persists after healing under medical treatment, and quotes Crohn in stating that hypersecretion and hyperchlorhydria persist also. Our success in surgical treatment depends on our ability to remove the cause and permanently to lower gastric acidity. The operation of choice is posterior gastrojejunostomy; in the writer's opinion it should not be combined with pyloric exclusion unless the ulcer has perforated (see JEJUNAL ULCERATION, p. 439). If there has been hæmorrhage, treatment by cautery as recommended by Balfour⁷⁹ should be adopted.

Shelton Horsley,⁸⁰ in advocating pyloroplasty with excision of the ulcer in the treatment of duodenal and gastric ulcer, does so on Balfour's report of 285 cases of gastric ulcer operated on at the Mayo clinic with 55.7 per cent cures, and on Smithies' conclusions that the percentage of complaint-free patients is very low, much below 50 per cent (among the 261 ulcer cases re-examined on which this is based, only 35 were duodenal). In his paper he does not distinguish between the result of operation for the two conditions. In the writer's opinion they cannot be discussed together. The operation advocated differs little from recognized procedures, but has not hitherto been recommended for the treatment of duodenal ulcer. As the first patient was operated on less than twelve months before the publication of the article, it is much too early to speak of success.

Finsterer,⁸¹ on account of the frequency with which jejunal ulceration has arisen after pyloric exclusion has been practised in addition to gastrojejunostomy (in 43 cases there were 7 jejunal ulcers), advocates resection of half to two-thirds of the stomach. Haberer⁸² for the same reason is performing duodenal resection with increasing frequency.

The writer, in view of the excellent results obtained by simple gastrojejunostomy, does not consider there is anything to be gained by the other procedures recommended.

For use of x rays in diagnosis of gastric disease see also pp. 25-28.

REFERENCES.—¹*Med. Record* 1920, Feb. 7, 220; ²*Jour. Amer. Med. Assoc.* 1920, March 27, 871; ³*Surg. Gynecol. and Obst.* 1919, May, 465; ⁴*Amer. Jour. Med. Sci.* 1917, Nov; ⁵*Arch. of Internal Med.* 1920, Aug., 221; ⁶*Arch. méd. Belges*, 1919, Aug., 136; ⁷*Ann. of Surg.* 1920, May, 628; ⁸*Rev. de Gynéc. et de Chir. abdom.* 1904, 965; ⁹*Brit. Med. Jour.* 1911, ii, 593; ¹⁰*Deut. Zeits. f. Chir.* 1920, April, 1; ¹¹*Ann. of Surg.* 1919, Aug., 237; ¹²*Traité chirurg. des Affect. de l'Estomac*, Paris, 1919, 6; ¹³*Brit. Med. Jour.* 1920, ii, 100; ¹⁴*Lancet*, 1920, i, 691; ¹⁵*Roentgen Diagnosis of Diseases of the Alimentary Canal*, 1917, 171; ¹⁶*Ann. of Surg.* 1919, Aug., 237; ¹⁷*Jour. de Chir.* xvi, No. 2, 129; ¹⁸*Lancet*, 1920, i, 691; ¹⁹*Brit. Jour. Surg.* 1916, Oct., 209; ²⁰*Amer. Jour. Med. Sci.* 1920, April, 469; ²¹*Choyce's System of Surgery*, ii, 321; ²²*Ann. of Surg.* 1912, 697; ²³*Lancet*, 1904, Aug. 6; ²⁴*Mittteil. a. d. Grenzgeb. d. Med. u. Chir.* xx, 1909; ²⁵*Deut. Zeits. f. Chir.* 1919, Aug., 60; ²⁶*Arch. ital. di Chir.* 1919, 1, 275 (reviewed in *Brit. Med. Jour.* 1920, April 17); ²⁷*Lancet*, 1910, i, 292; ²⁸*Edinburgh Hosp. Rep.* 1896, iv; ²⁹*Jour. Amer. Med. Assoc.*, 1919, Sept. 6, 802 (abstr. from *Nordist. med. Arkiv.*, Stockholm, 1919, May 15; ³⁰*Jour. Amer. Med. Assoc.* 1919, Oct. 4, 1038; ³¹*Zentralb. f. Chir.* 1913, 3; ³²*Rev. de Chir.* 1908, 208; ³³*Berlin. klin. Woch.* 1910, No. 17; ³⁴*Lancet*, 1920, i, 1359; ³⁵*Ibid.*, 1919, ii, 515; ³⁶*Surg. Clin. of Chicago*, 1920, Feb., 93; ³⁷*Lancet*, 1919, ii, 515; ³⁸*Jour. Amer.*

Med. Assoc. 1920, July 24, 228; ³⁹*Proc. Roy. Soc. Med.* (Surg. Sect.), 1920, 141; ⁴⁰*Lancet*, 1920, i, 251; ⁴¹*Brit. Med. Jour.* 1901, i, 1136; ⁴²*Surg. Gynecol. and Obst.* 1920, Jan., 80; ⁴³*Lancet*, 1919, ii, 615; ⁴⁴*Ibid.* 1920, i, 1384; ⁴⁵*Loc. cit.*; ⁴⁶*Proc. Roy. Soc. Med.* (Surg. Sect.), 1920, 142 et seq.; ⁴⁷*Bull. de l'Acad. de Méd.* 1920, Aug. 14, 507; ⁴⁸*Jour. Amer. Med. Assoc.* 1920, July 24, 219; ⁴⁹*Zentralb. f. Chir.* 1920, March 6, 223; ⁵⁰*Surg. Gynecol. and Obst.* 1914, Nov., 555; ⁵¹*Internat. Abstr. of Surg.* 1919, Oct., 257; ⁵²*Brit. Med. Jour.* 1920, i, 75; ⁵³*London*, 1913; ⁵⁴*Surg. Gynecol. and Obst.* 1920, April, 374; ⁵⁵*Archiv. Path. Inst. London Hosp.* 1906, 1, 39; ⁵⁶*Brit. Jour. Surg.* ii, 309; ⁵⁷*Brit. Med. Jour.* 1920, i, 559; ⁵⁸*Ibid.* 1919, ii, 765; ⁵⁹*Surg. Gynecol. and Obst.* 1914, Nov., 564; ⁶⁰*Proc. Roy. Soc. Med.* (Surg. Sect.), 1920, 142; ⁶¹*Brit. Med. Jour.* 1920, July 24; ⁶²*Ann. of Surg.* 1920, July, 109; ⁶³*Rev. Espan. de Cir.* 1919, Aug. (also *Jour. Amer. Med. Assoc.* 1920, Mar. 27, 923); ⁶⁴*Bull. de l'Acad. de Méd.* 1919, lxxx, 111, 370; ⁶⁵*Loc. cit.*; ⁶⁶*Proc. Roy. Soc. Med.* (Surg. Sect.), 1920, 176; ⁶⁷*Surg. Gynecol. and Obst.* 1919, Sept., 213; ⁶⁸*Ibid.* 1920, Feb., 190; ⁶⁹*Lancet*, 1920, i, 691; ⁷⁰*Ibid.* 1905, i, 34; ⁷¹*Ind. Med. Gaz.* 1920, Feb., 41; ⁷²*China Med. Jour.* 1918, Sept.; ⁷³*Ann. of Surg.* 1914, Aug., 432; ⁷⁴*Duodenal Ulcer*, 2nd ed., 432; ⁷⁵*Proc. Roy. Soc. Med.* (Surg. Sect.), 1920, 142; ⁷⁶*Loc. cit.*; ⁷⁷*Ann. of Surg.* 1919, Nov., 522; ⁷⁸*Brit. Med. Jour.* 1920, i, 559; ⁷⁹*Jour. Amer. Med. Assoc.* 1919, Aug. 23, 571; ⁸⁰*Ibid.* 575; ⁸¹*Zentralb. f. Chir.* 1919, No. 26, 434, and No. 52, 955; ⁸²*Med. Klinik*, 1920, March 14, 275.

STOMACH, ULCER OF. (See GASTRIC AND DUODENAL ULCER; STOMACH, SURGERY OF.)

SUGGESTION. (See PSYCHOLOGICAL MEDICINE.)

SUPPURATION, LOCAL.

Sir W. I. de C. Wheeler, F.R.C.S.I.

New Technique for the Treatment of Warm Abscesses.—In cases of superficial or deep abscesses the large crucial incision is generally employed; but the skin is almost always altered and infected, and a furrow remains, due to loss of substance. Jean¹ recommends the paralateral incisions for the treatment of abscesses which were initiated by Chaput. Being made in healthy skin, these heal quickly, and have the further advantage that at least one of them is at the lowest point of the collection and facilitates evacuation of the abscess.

In the case of a supra-aponeurotic abscess or a fixation abscess the author makes only a monolateral incision, placing it tangentially to the curve limiting the lower border of the collected mass to be evacuated. Puncture alone at the lowest point does not give sufficient drainage. After evacuation, even a very large incision will often heal very rapidly. In one case an incision 22 cms. long was healed by the fifth day.

Paralateral or bilateral incisions are used when it is necessary to explore a purulent cavity thoroughly, or when the cutaneous surface involved is too extensive to be treated effectively by a monolateral incision. Such incisions are therefore usually reserved for voluminous subcutaneous abscesses, suppurating hygomata, and deep abscesses involving muscles. They are made at the limit of the abscess, parallel to the axis of the limb or the trajectory of the nerve-trunks. One of them at least should reach the lowest point of the collected mass when the patient is lying down. After they are made, the cutaneous bridge is raised up by separators, the cavity is washed out, and diseased tissues are excised. The edges of the two incisions are then sutured, a rubber or filiform drain being inserted at the lowest point.

During eight months Jean performed 110 operations of this kind. None of the treatments formerly employed, such as counter-incisions, filiform drainage, irrigation, etc., has given him as rapid and satisfactory results.

REFERENCE.—¹*Arch. de Méd. et Pharm. nav.* 1919, cviii, 81 (abstr. in *Surg. Gynecol. and Obst.* 1920, Jan., 30).

SWEATING OF FEET, EXCESSIVE.

E. Graham Little, M.D., F.R.C.P.

Lopes¹ recommends from a considerable military experience the dusting of the feet with a powder consisting of 60 parts Alum to 40 parts Tale.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1920, Aug. 10, 511.

SYCOSIS BARBÆ.*E. Graham Little, M.D., F.R.C.P.*

Semon¹ would group the pustular infections of the beard under the following heads: (1) Seborrhœic sycosis; (2) Barber's rash—true coccogenic sycosis; (3) Tinea sycosis; (4) Lupoid and syphilitic sycosis; (5) Miscellaneous infections which may superficially simulate the sycoses.

Seborrhœic sycosis is to be recognized by the concomitant involvement of the seborrhœic areas, the scalp, eyebrows, eyelids. He also notes a type associated with chronic catarrh of the nose, and with pyorrhœa, and both the conditions should be treated.

Coccogenic sycosis is probably the result of shaving with blunt razors, and contracted more often at home than at the barber's shop. The common mistake is to order antiseptic applications which are far too strong, and the caution is given to use a *Soothing Lotion* such as this: calamine 1 drachm, lime-water 1 oz., with a little eau de Cologne or spirit added to it. This should be mopped on, not rubbed in, and gently dried with a clean towel. Shaving should be forbidden for forty-eight hours. If the suppuration still progresses, the best application is 1-4000 Cyanide of Mercury solution, which may be alternated with the calamine lotion mentioned above. If the disease has not subsided in spite of these means, *Epilation* of the affected hair may become necessary. This may be essayed with hot fomentations of 1-4000 cyanide. Chronic cases will generally call for *X-ray Treatment*. This should not be given while there is any sepsis. When there is much scabbing, continuous application of compresses soaked in the following lotion are to be used:—

R	Calaminæ	5ij	|	Aquam Calcis	ad 3j
	Olei Olivæ	5ij	|		

If these are not successful, *Boric-Starch Poultices* are to be kept on the part for not more than an hour at a time.

Tinea sycosis is most often contracted from horses or dogs, which should be examined. The fungus may be difficult to find, and more success is likely to attend attempts to grow it on Sabouraud media. The author dislikes x-ray treatment for these cases, and prefers *Epilation* by forceps, combined with *Hot Boric Fomentations*. The beard should be cut only with scissors, not shaved. It is claimed that an immunity is established within two months.

The remaining types are too rare to need notice.

REFERENCE.—*Practitioner*, 1920, Jan., 48.

SYPHILIS.*Colonel L. W. Harrison, D.S.O.***DIAGNOSIS.**

Wassermann Test.—In an endeavour to discover those features which make for variations in the behaviour of the various ingredients in the Wassermann test, the bacteriologists of the Ministry of Health conducted an extensive research, the result of which was published by the Ministry in a volume of 214 pages.¹ The subject matter is highly technical, and the original must be consulted for details, but broadly it was found by Griffith and Scott that: (1) Not only is there no constant relation between fixability and hæmolytic activity of complement, as already shown by Browning and Kennaway, but there is no fixed relation between these and fixability of complement by antigen alone. (2) Extract as ordinarily prepared contains a variable amount of cholesterol, which, with that usually added in the technique followed by most laboratories, may lead to non-specific results. Accordingly, in a new test which has been evolved as a result of this research, it is proposed to remove the cholesterol from heart extract, with the other acetone-soluble components, and then to add to the remnant that amount of cholesterol which

is found by experiment with a given extract to give the best results. The amount of this extract used in the test is a volume (0.25 c.c.) of $\frac{1}{10}$. The new method employs a fixed amount of complement, which has been titrated only to ascertain that it comes up to standard, not to determine the amount to be used; the amount is fixed because of the lack of any definite relation between hæmolytic activity and fixability. To determine strength of reaction, the amount of serum is varied, because it was found that the method by which complement is varied disclosed greater differences between different guinea-pig complements. Thus, when a given serum was tested against a number of complements, the strength of the reaction varied more when determined by complement strengths than when the serum was tested in varying amounts against fixed amounts of the same complements. The preliminary fixation takes place over night in the ice-chest. As far as the reviewer's experience goes, this new method of conducting the test is more delicate, in the sense of giving a higher percentage of positives in cases of syphilis, especially treated cases. Serologists will find in the details of Drs. Griffith's and Scott's experiments, and in Dr. Eastwood's critical review of the literature bearing on the mechanism of the Wassermann test, much that is instructive and stimulating.

On the specificity of the Wassermann test, and its value as a guide to treatment, much has been published, but nothing to lead one to reconsider the remarks on this controversy which were made in the MEDICAL ANNUAL last year (p. 336).

C. H. Browning² considers that a negative reaction in the early latent period (up to four to six years after infection) cannot be taken as evidence that the infection will not relapse subsequently. In the early stages blood-tests should be undertaken monthly. In the later stages the sensitized tissues react strongly to scanty activity on the part of the spirochæte, and the Wassermann reaction easily becomes positive. Such a result, while not in itself evidence of infectivity, cannot be neglected, since a proportion of syphilitics may transmit the disease many years after infection. Accordingly, a positive reaction is an indication for specific treatment prior to risking transmission. In this connection is quoted a report by Trichinese in which a man gave a positive reaction eight years after infection. He was treated by mercurial inunctions prior to marriage, eleven months after which a healthy child was born. Two years later another healthy child was born, and the blood of the mother remained negative. Ten months later the mother showed a typical roscolar rash, and her reaction was positive, as was also, again, that of her husband. [Assuming that the mother had not been infected from an extra-marital source, this appears to be a clear case for continuing treatment in patients who give a positive reaction, however old the infection. There is much in the warning voiced by Browning and many other authorities on syphilis not to rely too much on a negative Wassermann reaction. This applies particularly to the practice of many workers who treat early cases with arsenobenzol only until the reaction becomes negative. It should be impressed, too, on the lay public, that a negative reaction does not spell cure. A frequent excuse given for non-attendance at a clinic is that "My blood was negative", and, as Lakaye remarks, it would be well to adopt other signs than those at present employed to denote the results of blood-tests on documents, such as treatment cards, which may be read by patients.—L. W. H.]

Sachs-Georgi Serum Reaction.—Sachs and Georgi published a new precipitation reaction given by syphilitic sera which has stimulated a large volume of publications on its specificity. Broadly the original method³ was to add 1 c.c. inactivated patient's serum, diluted to 1-10, to 0.5 c.c. of an alcoholic heart or liver extract fortified with cholesterol. The tubes were placed in the

incubator at 37°C. for two hours, and left at room temperature for eighteen hours. They were then examined for flocculi through a Kuhn and Woithu's agglutinoscope. It was found that, besides the sera of syphilitic patients, those of tuberculous, cancerous, and other patients gave a positive reaction, and Sachs and Georgi modified the technique,⁴ recommending that incubation at 37° C. proceed for eighteen hours. This appears to have largely eliminated non-specific reactions, as the precipitate produced by some non-syphilitic sera dissolves on further incubation.

Baumgärtel⁵ has collected the results of 17,185 tests, in parallel with Wassermann tests, by nineteen workers. The results of the two tests agreed in 91.43 per cent. In 409 cases the Wassermann reaction was positive and the Sachs-Georgi reaction negative, and in 614 cases the Wassermann reaction was negative and the Sachs-Georgi reaction positive. In his own 7000 cases, the author found agreement with the Wassermann reaction in 89.9 per cent; in 709 results which differed, 63.6 per cent gave a positive Wassermann reaction and 36.4 per cent a positive Sachs-Georgi reaction. Schönfeld⁶ found that 4 out of 231 non-specific sera gave positive reactions to Sachs and Georgi's second method, and 28 out of 291 to the first method. The four cases comprised three of gonorrhœa in females and one lupus. L. Kumer⁷ obtained no non-specific reactions, though his series contained 38 cases of chancreoid. Various authors, as Wodtke,⁸ Plaut,⁹ and Poehlmann,¹⁰ obtained sharper results by increasing the quantity of serum to 1 c.c. of 1 in 5.

Generally, the reports by various authors show a close agreement between the Wassermann and the Sachs-Georgi reactions, but the latter cannot at present replace the former. Extracts which are suitable for the one test are not necessarily suitable for the other, and results are not always easy to read. For the discussion of the principles underlying this and other precipitation reactions the reader is referred to Dr. Eastwood's article in the *Ministry of Health's* volume mentioned above.

New Serum Test.—Vernes¹¹ has evolved a serum test for syphilis which depends on the following: (1) Syphilitic serum precipitates colloidal 'solutions' much more powerfully than normal. (2) Pig serum counteracts this precipitating effect of syphilitic serum, and, in doing so, loses its power of hæmolyzing sheep's cells. (3) Therefore a syphilitic serum in contact with pig serum and a colloidal solution will interfere with the lysis by the pig's serum of sheep's cells subsequently added. The colloidal solution employed is a specially prepared horse's heart extract called 'péréthynol',¹² standardized to the correct degree of opalescence by comparison with a diaphanometric scale. The pig serum and sheep's cells, in a slightly hypertonic solution, are used in amounts which together give hæmolysis corresponding to tint 8 of a specially prepared colorimetric scale made with fuchsin. The tints in this scale vary from 8, corresponding to complete lysis, to 0, corresponding to no lysis. Thus a strongly syphilitic reaction would result, by interference with the hæmolytic effect of pig serum on sheep's cells, in the tube contents corresponding in colour to tint 0. The details are highly technical, and the péréthynol is not easy to prepare and standardize, so that the test is not a simplification of the Wassermann. An interesting fact bearing on the interpretation of the Wassermann test, which quite possibly depends on the same principle, is that the precipitating power of syphilitic serum on colloidal solutions waxes and wanes, so that the result of a single test to-day is no indication of what it may be next week or month. Uffholtz,¹³ having investigated Vernes' test, concludes that, by his 'syphilimétrie', it can be shown that: (1) Every syphilitic infection is accompanied by a pathognomonic modification of the serum; (2) This may disappear under the influence of treatment, but

each time this has been insufficient it reappears from the third to the eighth month, usually between the fifth and seventh; (3) When it has failed to reappear and the cerebrospinal fluid has remained free from signs, it has never been noticed to reappear; (4) A series of tests conducted on the same patient under treatment, and the results charted, show clearly the intensity of the reaction of the tissues and the resistance to treatment.

TREATMENT.

Newer Arsenobenzol Remedies: Silbersalvarsan and Arseno-argenticum.—Dreyfus¹⁴ considers **Silbersalvarsan** to be superior in therapeutic effect on early syphilis of the brain and on cerebrospinal syphilis to neosalvarsan and salvarsan natrium. In tabes the new preparation requires some caution, as it is apt to provoke severe reactions; and in an urgent case, where injections must follow one another rapidly, he would prefer at present to use neosalvarsan and salvarsan natrium. In aortic disease also he gives preference to the older preparations. He considers, however, that silbersalvarsan marks an important advance in therapy. Rille and Frühwald¹⁵ review much of the recent experience with silbersalvarsan. Kolle showed the good effect of silver alone on rabbit syphilis, and that silbersalvarsan has a therapeutic dose which is $\frac{1}{3}$ to $\frac{1}{10}$ of that which can be tolerated, so that, although its arsenic content is only two-thirds that of '606', it is two to three times as active (it contains 12.7 per cent of silver). Most of the authors quoted report effects at least as good as those produced by '606'. The side-effects are similar to those produced by other arsenobenzol injections—viz., vasomotor, erythema, jaundice, and cerebral—but the publications do not make it clear whether the proportion is greater or less. The dose for male adults varies from 0.15 to 0.25 or 0.3 gm., which is usually administered in 5 to 10 c.c., and eight to fifteen injections are given in a course at four- to five-day intervals.

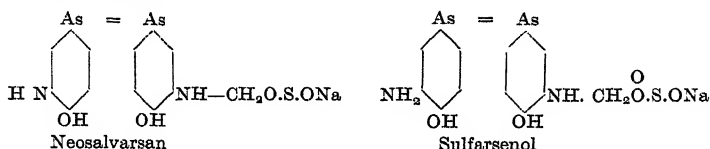
J. Hoppe¹⁶ has investigated the excretion of silbersalvarsan. After the injection of 0.2 gm. (As, 0.043; Ag, 0.0254), 0.019 As and 0.014 Ag were recovered in the first day's urine. In the first four days 0.0325 As and 0.014 Ag were recovered; thereafter traces of arsenic until the tenth day, but no silver, the balance of which seems to be retained in the body. In contrast with '606', very little of the arsenic of the silver preparation is excreted through the bowel. After intramuscular injection, two-thirds of the arsenic was accounted for in six days. Apparently the balance remained in the muscle. An observation of possibly practical importance is that, if magnesium salts are administered to a patient under treatment with arsenobenzol, the excretion by the bowel is shortened from six days to four. For this reason Hoppe considers that the administration of magnesium lessens the danger of damaging the liver by arsenobenzol compounds.

Karl Stern¹⁷ recommends a very simple technique for intravenous injection of silbersalvarsan. The powder is dissolved in 2 to 3 c.c. of warm tap-water contained in a 10-c.c. syringe. After puncturing the vein, the piston is withdrawn until the syringe is full of blood and remedy before being pressed home. He mentions the observation of Kolle that the admixture of albumin—e.g., blood—reduces the toxicity of silbersalvarsan. Stern has found, like Hoppe (*loc. cit.*), that intramuscular injections are very well tolerated.

Arseno-argenticum (prepared by Messrs. May & Baker) is apparently identical with silbersalvarsan. At least the reviewer has been unable to detect any difference in therapeutic and other effects between the two. It is advisable in administering these preparations to do so very slowly and in fair dilution, say 0.1 gm. in 7.5 c.c.; otherwise they are apt to cause vasomotor

symptoms. This advice is emphasized by Hahn,¹⁸ who recommends a 1 to 1.5 per cent solution; he gives 0.25 grm. twice each week to a total of 3 grms. as a full course for a healthy man.

Sulfarsenol, prepared by Pluchon, is a new arsenobenzol compound which in therapeutic and physical properties is similar to neosalvarsan, the formulæ of the two being as follows:—



Lévy-Bing, Lehnhoff-Wyld, and Gerbay¹⁹ reported on it favourably in France, and F. C. Doble²⁰ in this country. Its outstanding feature is that it causes practically no discomfort when injected into the deep subcutaneous tissues, and is undoubtedly the best preparation available for this purpose. [A dose of 0.3 grm. can be dissolved in 1 c.c. or less of water. The injection should be made into the tissues overlying the fascia covering the glutei. If injected *into* the muscle it causes some late reaction in the form of aching.—L. W. H.] Galonnier²¹ finds that, after intravenous injection, arsenic appears in the urine within an hour, and the maximum elimination takes place within the first few hours. After intramuscular injection arsenic appears rather later—towards the end of the first hour—and the maximum excretion is delayed until the end of the first day. Practically all is excreted within six or seven days, whatever the method of injection, and whether the dose is 0.60, 0.75, or 0.80 cgrm.

Schamberg, Kolmer, and Raiziss²² have studied the comparative toxicity of salvarsan and neosalvarsan, and their therapeutic effect on trypanosomiasis of rats, and find that '606' is 2.4 times as toxic as '914', while it is 1.74 times

as active therapeutically. The ratio $\frac{\text{Dosis tolerata}}{\text{Dosis therapeutica}}$ for '606' is 4.56, and for '914' is 6.35. Their results agree closely with those of Castelli,²³ who found '606' 1.78 times more active than '914' in hen spirillosis, and 1.5 times in rabbit syphilis. They conclude that '914' is a somewhat safer compound than '606', since, for an equal effect, the margin of safety is greater. [No account has been taken by the authors of late toxic effects—dermatitis and jaundice—which appear to result in quite as high a proportion of cases treated with '914' as with '606', though the dosage of the former is calculated on Ehrlich's original ratio, in which 0.9 grm. '914' = 0.6 grm. '606'. Until another ratio based on the later toxic effect of '606' and '914' respectively has been worked out, it would appear unwise to increase the dosage of '914' in accordance with the above experiments. Undoubtedly 1.5 of '914' does not produce the same therapeutic effect on syphilis as 1.0 of '606', but trouble is likely to follow if the amount administered in a given time is increased to correspond with the ratio 1.7 to 1.0. Neosalvarsan retains its position in antisymphilic therapy chiefly because of its convenience and the rarity of its *immediate* toxic effects. In other respects it appears inferior to salvarsan.—L. W. H.]

TOXIC EFFECTS OF ARSENOBENZOL REMEDIES.

Numerous articles have been published on the later toxic effects of arsenobenzol injections, and it will be possible to review here only those which have a practical bearing on treatment.

B. B. Beeson²⁴ reviews the subject of polyneuritis and exfoliative dermatitis following injections of *Neosalvarsan*. He recalls that Duhot²⁵ noted this syndrome in patients treated on Schreiber's original plan of massive doses (1.2 to 1.5 gm.) every two or three days. The patients complained first of formication and pain in the soles and calves, which in more severe cases developed into polyneuritis with text-book signs, and exfoliative dermatitis. He emphasized the importance of testing the reflexes before commencing treatment. Numerous workers have noted exfoliative dermatitis with or without jaundice, but comparatively few have recorded their association with polyneuritis. Sicard²⁶ draws attention to the importance of loss of the Achilles reflex during treatment as an indication for caution in continuing treatment. Usually the reflex disappeared in a man after he had received 8 to 10 grms. and in a woman after 6 to 8 grms. Sicard and Roger have indicated another sign of arsenical intolerance, the application of tincture of iodine to the skin producing a vesicular dermatitis at the site of the application. Beeson quotes cases of polyneuritis following arsenobenzol injections which have been published by about thirteen other authors, and reviews the literature on the rare cases which have been attributed to syphilis and to mercury. His own case was an alcoholic who first received one injection of 0.6 gm. (of '914') and then five of 0.9 gm. at weekly intervals, and, after a rest of three weeks, two more of 0.9 gm. Very severe exfoliative dermatitis followed, with complete neuritic paralysis below the knees and diffuse paresis of the arms. Eventually, after a very severe illness, the patient recovered completely.

McDonagh²⁷ states that since he has included *Intramine* in the treatment of every case of syphilis, he has not had a single instance of metallic poisoning within a period of nearly five years, with the exception of one mild case of jaundice. He advises that in all early cases 2.5 c.c. should be injected intramuscularly after the fourth or fifth intravenous injection of arsenobenzol. In cases of severe metallic poisoning, 100 c.c. colloidal iodine should be injected intravenously and 2.5 c.c. *intramine* intramuscularly. Ffrench²⁸ speaks highly of *intramine* in cases of dermatitis.

[In my experience *intramine* has often proved valuable in aborting erythema due to arsenobenzol. On the other hand, I have frequently seen it fail, and it would certainly appear unwise to imagine that the introduction of this remedy into a course of treatment for syphilis will free it from risk of causing dermatitis. Some of the worst cases of dermatitis I have seen had been treated on this principle, the *intramine* injections having failed to make up for neglect to watch the patients for signs of intolerance; Whether *intramine* injections during the ordinary course, plus a careful watch for these signs and timely suspension of the treatment, will reduce the incidence of dermatitis, I cannot certainly say. In two military hospitals during the war, the behaviour of 258 cases to whom 2.5 c.c. *intramine* was administered after the third arsenobenzol injection and 5 c.c. after the seventh, was compared with that of 258 similar cases similarly treated with arsenobenzol but without *intramine*. The control series contained one mild case of jaundice, and the *intramine* series one jaundice and one dermatitis, so that there was little to choose between them.—L. W. H.]

C. V. Bailey and A. MacKay²⁹ distinguish three types of toxic symptoms due to arsenobenzol. The first is the immediate reaction, which usually passes off within twenty-four hours; the second, dermatitis; and the third, due to poisoning of the liver, may be delayed for many months. They have made a series of analyses of the blood and urine in 25 cases of arsenobenzol jaundice, 2 of catarrhal jaundice, 1 of syphilitic hepatitis, and 12 recovering from other, non-hepatic, diseases. For the details the original paper should be consulted.

They conclude, *inter alia*: (1) That an increase of cholesterol in the blood is an early and marked sign of damage to the liver by arsenobenzol remedies (averaging 0.235 per cent against a normal 0.15 per cent); its routine estimation by the method of Myers and Wardell³⁰ may be of value in detecting the onset of liver injury. (2) Exercise should be restricted greatly during the course and for a few weeks afterwards. (3) A diet rich in carbohydrate and very low in protein and fat should precede, accompany, and follow the administration of arsenobenzol remedies. (4) The appearance of delayed poisoning by arsenic, phosphorus, etc., is possibly due to the premature increase of protein in the diet and of exercise.

Strathy, Smith, and Hannah³¹ made a careful study of 58 cases of jaundice (8 of them fatal) amongst Canadian soldiers who had been treated with neokharsivan, novarsenobillon, or galyl, and conclude that severe damage to the liver may be prevented by careful observation of the patient's urine before and after each injection, and by looking out for malaise and signs of dermatitis. Timely restriction of the diet and of exercise on the principles indicated above by Bailey and MacKay resulted in no fatal cases occurring after March, 1918, when these precautions were instituted. [It is necessary to note, however, that only two fatal cases of toxic jaundice occurred amongst cases treated in all the other military venereal disease hospitals in the United Kingdom after this date. One had been treated with luargol, and one with 1.05 gm. '914' in 23 days. As far as I know, no greater dietetic restrictions than before had been instituted in these other hospitals, and exercise had been increased, in response to a rather strong wave of enthusiasm for keeping the venereal soldier fit which prevailed at that time. Whilst, therefore, believing that the authors are correct in advising restriction of diet and exercise of patients undergoing antisypilitic treatment, I believe that a factor not to be neglected is the amount of arsenobenzol administered in a given period. On a course of 2.8 grms. '606' in 50 days, the Lichfield Central Hospital experienced 11 cases of dermatitis and 12 of jaundice from 19,100 injections; while, on a course of 2.6 grms in 57 days, 2 cases of jaundice and 2 of dermatitis resulted from 11,734 injections. The Army Hospital in the United Kingdom which experienced by far the most cases of fatal jaundice (17) gave 2.8 grms. of '606' in 42 days.—L. W. H.] For the treatment of their cases, Strathy and his colleagues gave 30 oz. of skimmed milk and 2 oz. sugar daily, with plenty of tea and water. The diet was increased by adding 2 oz. jam and a slice of bread. Absolute rest in bed was insisted upon, and bicarbonate of soda (2 drachms) was given daily.

Foulerton,³² like others, has found the liver changes in arsenobenzol jaundice similar to those produced by trinitrotoluene poisoning, but, as a result of animal experiments, thinks that both the arsenic and the benzene constituents may play a part. He advises a strict medical regimen throughout the treatment so as to reduce the work of the liver. The diet should consist mainly of carbohydrates, and very small quantities of lean meat, avoiding milk, fats, and alcohol.

R. Hallam³³ has studied the incidence of jaundice in Sheffield and other V.D. clinics, and as a result of his inquiries is inclined to believe that jaundice is more common in cases treated in Sheffield than, at any rate, in thirteen other centres, though the course of treatment is much about the same in all, and he can vouch for the technique in Sheffield. He is struck also by the comparatively sudden appearance of the jaundice in his clinic after many months of freedom, though he understands the remedy has not changed and his technique has remained the same. He records an instance in his own clinic of husband and wife suffering from arsenobenzol jaundice, and mentions that this grouping of cases has been observed by other workers. Whilst, therefore, admitting

the responsibility of arsenobenzol, and believing that '914' is more liable to cause jaundice than '606', he suggests the possibility of an underlying infection, e.g., Weil's disease. [The apparently epidemic incidence of arsenobenzol jaundice was a striking feature of the military cases during the war. In one hospital no fatal case had happened from early in 1915 until the middle of 1917, when, without any change in technique or dosage, a fatal case of jaundice occurred. From then until February, 1918, there were 16 more fatal cases, and after that no more until the hospital closed in 1920. Another feature was that all the fatal cases happened in one half of the hospital, though the drug was mixed for both halves by the same person, using the same ingredients, and the dosage was the same. In this hospital the concentration of the treatment was greater than in most other military hospitals, but this was a constant. It seems reasonable to suppose that an underlying infection may predispose to jaundice, that arsenobenzol sets the spark to the train, and the heavier the spark the more certain the explosion. Jaundice, apart from arsenobenzol, is a disease of campaigns, and it may be that jaundice is now more prevalent amongst the civil arsenobenzol-treated cases because demobilized soldiers have brought back to their homes the infection of campaign jaundice.—L. W. H.]

Meirowsky³¹ gives an abstract of the report of the German Commission which sat to inquire into the incidence of toxic effects of arsenobenzol injections. In response to a circular letter, the Commission had received from 182 practitioners and clinics the results of 13,000 injections of original salvarsan, 40,954 of salvarsan natrium, and 171,826 of neosalvarsan, and the reports included 20 deaths, which the commission divided into 12 certainly due to arsenobenzol, 5 doubtfully, and 3 indirectly. The analysis of the incidence of fatalities according to the maximum individual dosage showed that, in cases where this did not exceed 0.6 grm. of neosalvarsan, the mortality was 1 in 162,800 injections. In the series where the doses exceeded 0.6 grm. the chances of death were increased 54 times, viz., to 1 in 3000 injections. The commission are convinced that the highest dose given to men should be 0.6 grm. and to women 0.45 grm., and that the sale of larger individual doses should be stopped.

The use of **Arsphenamin** discussed (p. 4).

REFERENCES.—¹*Reports on Public Health and Medical Subjects*, No. 1, H.M. Stationery Office, 1920; ²*Glasgow Med. Jour.* 1920, July, 13; ³*Med. Klinik*, 1918, 33; ⁴*Munch. med. Woch.* 1919, No. 15; ⁵*Ibid.* 1920, No. 36, 421; ⁶*Ibid.* 399; ⁷*Wien. klin. Woch.* 1920, No. 26, 562; ⁸*Munch. med. Woch.* 1920, No. 15, 419; ⁹*Zeits. f. d. g. Neurol.* 1919, lii, 204; ¹⁰*Derm. Zeits.* 1920, xxix; ¹¹*Presse méd.* 1919, No. 34; ¹²*Comptes rend. Acad. d. Sci.* 1918, clxvi, 575; ¹³*Arch. de Méd. et de Pharm. milit.* 1918, Dec.; ¹⁴*Munch. med. Woch.* 1919, No. 21, 864; ¹⁵*Ibid.* No. 43, 1226; ¹⁶*Ibid.* No. 48, 1376; ¹⁷*Ibid.* 1377; ¹⁸*Deut. med. Woch.* 1920, No. 46, 92; ¹⁹*Ann. des Mal. vén.* 1919, ix; ²⁰*Lancet*, 1920, ii, 243; ²¹*Recherches sur l'Administration et l'Élimination du Sulfarsénol*, Vve. Bonnet, Toulouse, 1920; ²²*Amer. Jour. Med. Sci.* 1920, July, 25, and Aug., 188; ²³*Zeits. f. Chemotherap. orig.* 1912-13, i, 122-135 and 321-353; ²⁴*Arch. of Dermatol. and Syph.* 1920, Sept., 337; ²⁵*Rev. Belge. Urol. et Dermato-Syph.* 1912, i, 91; ²⁶*Bull. Soc. méd. Hôp. de Paris*, 1919, xxxv, 833, 930; ²⁷*Practitioner*, 1920, Jan., 14; ²⁸*Lancet*, 1920, ii, 1262; ²⁹*Arch. of Internal Med.* 1920, June, 628; ³⁰*Jour. of Biol. Chem.* 1918, xxxvi, 147; ³¹*Lancet*, 1920, ii, 802; ³²*Brit. Med. Jour.* 1920, i, 864; ³³*Lancet*, 1920, i, 1356; ³⁴*Munch. med. Woch.* 1920, xlvii, 477.

SYPHILIS, CARDIOVASCULAR. (See also ANEURYSM.)

Carey Coombs, M.D., F.R.C.P.

Ivy Mackenzie¹ emphasizes the stealthy and unperceived nature of the attack which syphilis makes on the body, the circulatory apparatus being particularly singled out. By the time this attack has become perceptible by reason of symptoms, the lesions of the heart, aorta, etc., are already advanced. At the Fourteenth French Congress of Medicine,² there was some discussion as to the means by which the spirochæte inflicts these lesions—whether it is

always present in the diseased area, or whether it acts from a distance through the agency of toxins. The organism has been demonstrated in the inflamed aorta, but in very small numbers.

The practical bearing of these considerations is to be seen when we come to consider the treatment of the disease. Is it worth while to give salvarsan, or not? The general opinion seems to be that Neosalvarsan ought to be given, and there is an agreement that the doses should be small. Several writers claim good results from divers variations of this plan (Vaquez, Laubry and Donzelot,² Reid,³ Kothny and Muller-Deham⁴), but it may be doubted whether the profession might not better employ its time in striving to prevent the disease than in contriving plans of treatment which are probably as innocuous to the spirochæte as they are to the patient.

Winternitz and Schweitzer⁵ record examples of syphilitic disease of the pulmonary artery, which should be read with an article by Warthin⁶ on 'Ayerza's disease', a form of cyanosis with erythræmia and right-heart failure, associated with pulmonary arteriosclerosis.

REFERENCES.—¹*Glasgow Med. Jour.* 1919, Nov., 209; ²*Presse méd.* 1920, 343; ³*Jour. Amer. Med. Assoc.* 1912, ii, 1832; ⁴*Wien. klin. Woch.* 1920, 77; ⁵*Johns Hop. Hosp. Reps.* 1919, 145; ⁶*Contributions to Medical and Biological Research* (Osler Memorial), vol. ii.

SYPHILIS OF THE CENTRAL NERVOUS SYSTEM.

Colonel L. W. Harrison, D.S.O.

Plaut¹ finds that, as soon as a positive Wassermann reaction appears in the blood, there are pathological changes in the cerebrospinal fluid in 84 per cent of untreated cases. It appears that, in the majority of cases, these changes disappear, and do not reappear except in association with manifest symptoms of disease of the central nervous system. The inference from this is that a patient in the early stages with pathological changes in his cerebrospinal fluid is not necessarily doomed to late disease of the central nervous system, but changes in the fluid of a late case are of serious import. [It is not yet clear how long *Spirochæta pallida* is present in the central nervous system before giving rise to the first series of changes in the fluid, but it is clear that the ideal time at which to commence treatment is before the Wassermann reaction of the blood has become positive.—L. W. H.]

Plaut advises treatment of central nerve disease as follows. Ten days' Mercurial Treatment by inunctions or injections at three-day intervals. If no rise of temperature occurs, Neosalvarsan is commenced in doses of 0.15 increasing to 0.6 grm, by daily intravenous injections, until 1.5 to 2 grms have been given. This combined mercurial and neosalvarsan course is repeated after two months and again after a similar interval. The cerebrospinal fluid is examined before the first course, two months after each course, and subsequently at the end of the first and second years.

Sicard² claims better results from injections daily or on alternate days of Novarsenobenzol than from larger weekly injections. The injection is given either intravenously, or into the deep subcutaneous tissues, below the fat, of the upper part of the thigh. In cases of tabes, as a rule, a total of 6 to 8 grms. is given in two subcutaneous doses of 0.15 and one intravenous of 0.3 grm. per week. Usually 20 to 25 grms. are given in this manner in a year unless signs of intolerance develop.

O. Clark³ believes that only thorough treatment in the earliest stages of syphilis will insure against tabes, and the spinal fluid should be examined once or twice a year, as one negative is of no value. He records, however, three cases of tabes which became fulminating after lumbar puncture.

Porot and Sengès⁴ have seen only one case of general paresis in a considerable experience amongst the natives of Algeria. They are inclined to attribute this great rarity of paresis to the habitual calm of the Arab temperament, though it may be due to the absence of that particular strain of *Spirochaeta pallida* which some workers think is alone responsible for tabes and general paresis.

Fildes, Parnell, and Maitland⁵ examined the cerebrospinal fluid of 624 early cases of syphilitics in various stages, which were practically as follows: (1) With a primary lesion but negative Wassermann reaction of blood; (2) Primary cases with a positive Wassermann reaction; (3) Secondary within eleven weeks of infection; (4) Ditto from twelve to twenty-six weeks after infection; (5) Ditto more than twenty-six weeks after infection; and (6) 'Latent' cases with a positive Wassermann reaction. They found that 115 (18 per cent) had 10 or more cells per cmm., indicating an abnormal fluid, and 73 (11 per cent) had .5 to 9 cells (doubtfully abnormal), making a total of 188 with definitely or doubtfully abnormal fluid. The pleocytosis was found most frequently (29 per cent) in secondary cases from twelve to twenty-six weeks after infection. A positive Wassermann reaction was given by the fluid in 6 per cent, and was most frequently observed in those with a high cell-count. An important feature was the lack of nervous symptoms and signs in the cases examined. Thus, out of 99 cases with abnormal fluid, only 20 had symptoms and 8 definite signs of disease of the central nervous system.

C. Frothingham⁶ has investigated the question whether syphilis of the central nervous system can always be detected without having recourse to lumbar puncture. The question is important, since most authorities consider that the earlier syphilis of the central nervous system is treated the better the results. In 231 cases with pathological fluid, 121 were diagnosed as tabes, and in two of these the first indication of involvement of the central nervous system was given by the cerebrospinal fluid. One had been diagnosed as pulmonary tuberculosis, but the blood giving a positive reaction and no bacilli having been found, a lumbar puncture was performed and the fluid found to be positive; on going back over the history, the result of the fluid examination shed light on some vague stabbing pains about the shoulder-blades, and odd, non-radiating pains in the legs which had occurred now and again in the previous three years, but had not attracted any great attention. In the other case the patient had been operated on for carcinoma of the stomach and pyloric stenosis. The fact of the patient's blood giving a positive Wassermann reaction suggested that it might be worth while to examine the fluid to see if the stomach symptoms were attributable to gastric crises. There was no history of syphilis or gross physical signs, and only the blood and fluid examinations settled the diagnosis. In one case now showing signs of tabes, a laparotomy had been performed three years previously but no tumour was found, and a pyloroplasty had been carried out without relief to the symptoms. At the time of the operation the blood gave a positive Wassermann reaction, but reflexes were normal, and there were no active signs of syphilis. On admission to hospital three years later for persistent gastric symptoms, the patient showed definite signs of tabes. Another patient had been in hospital for diabetes five years previously. His blood gave a positive Wassermann reaction, but there were no other signs of syphilis and nothing was done. On re-admission five years later there were definite signs of tabes. The author concludes that, in his series of 121 cases of tabes, two had been overlooked for years because there were no other signs than a positive blood reaction, and an examination of the cerebrospinal fluid had not been carried out. In other cases in his series diseases of the central nervous system would have been overlooked but for examination of

the fluid. The author concludes that lumbar puncture should be carried out in all old cases of syphilis, since the earliest possible treatment of central nerve syphilis gives by far the best results.

On the other hand, J. Kyrle⁷ presents the results of an investigation into the condition of the cerebrospinal fluid which appear to show that pathological fluid in old cases of syphilis does not necessarily indicate that the patients concerned are doomed to disablement from the effects of disease of the central nervous system. The author examined the cerebrospinal fluid of 618 out of 737 prostitutes, of whom 8 were primary cases, 220 showed gross signs of systemic syphilis (relapse cases), and 390 could fairly be described as latent. Out of the 390 latent cases, nearly one-half (191) showed pathological changes in the cerebrospinal fluid (126 with positive Wassermann and 65 with slight increase of cells or globulin). Out of these 191 cases, 117 were examined by two trained neurologists, and in 50 no clinical signs of nerve disease were found (37 of these had pronounced changes in the fluid and 13 showed slight changes). Of the 67 who showed some clinical signs, in 32 these were limited to such as sluggishness or inequality of pupil light reflexes, differences in tendon reflexes, such as sluggishness, and so on (28 of these had pronounced fluid changes and 4 had slight). In 28 the signs were more marked—viz., fixed pupils on one or both sides, loss of one or more tendon-jerks on one or both sides, or slight Rombergism. In 7 the clinical signs were clearly those of tabes or of tabo-paralysis. In this connection the investigation of Mattauschek and Pilcz⁸ will be remembered. Out of 4134 syphilitic officers whose life-history was watched for twenty years after infection, about 10 per cent had developed clinical signs of severe disease of the central nervous system.

Analysis of Kyrle's cases according to the history of previous treatment revealed no great difference between the proportion of those who had been well treated and of those who had received little or no treatment whose fluid showed pronounced pathological changes. In the untreated it was 1 pathological to 3.38 normal and in the well-treated it was 1 to 3.48. The author remarks on the difficulty of changing a completely positive fluid to negative in the later stages by ordinary methods of treatment. The number of cells and the globulin can be reduced considerably, but the Wassermann and gold-sol reactions are particularly resistant. In contrast to the early stages, he has not noticed slight changes in the fluid become pronounced, and he does not regard slight changes in the later periods as having the same future significance as in the early secondary period, when they may be only a stage towards those complete changes which are so resistant to treatment. The author thinks his investigation supports the pessimists, with regard at any rate to the future of patients who have developed pronounced changes in the cerebrospinal fluid before treatment commences, or who relapse with such changes.

Plurality of Strains of the Syphilitic Virus.—Pagniez⁹ reviews the recent discussions on the old controversy relating to the question of the existence of a special neurotropic strain of *Spirochæta pallida* which alone causes tabes and general paresis. It will be remembered that the question arose from clinical observations by various workers, such as Erb, Brosius, Nonne, Babinski, and Mott, that groups of persons infected at the same source (one prostitute or mistress) all subsequently developed syphilis of the central nervous system. Levaditi and Marie¹⁰ investigated the question further, and pronounced in favour of the existence of a special neurotropic strain, shortly on these grounds: (1) The spirochæte from the paretic brain inoculated into the scrotum of a rabbit develops much more slowly—the incubation of the inoculation lesion being four months—in contrast to the ordinary, dermatropic virus, which produces a lesion in six weeks; successive passages from animal to animal do

indeed result in shortening the period of incubation, but only to 40 to 60 days, in contrast to that of the dermatropic strain, which is shortened to 15 days. (2) The lesions differ as examined by the naked eye and histologically, the neurotropic strain causing much less arteritis. (3) The neurotropic virus loses its virulence for monkeys after one passage through a rabbit; the dermatropic retains it after many passages. (4) A volunteer inoculated with the neurotropic strain showed no lesion, and his Wassermann reaction remained negative; another accidentally inoculated with dermatropic virus developed a typical lesion. (5) A rabbit inoculated with the dermatropic virus was not immunized against subsequent inoculation with neurotropic virus, though a simultaneous inoculation with dermatropic virus failed. Pagniez considers the question by no means settled by these experiments, and holds it possible that long residence in nerve tissue may have changed the characters of a virus which was originally identical with what is called dermatropic by the pluralists.

Sicard¹¹ contests the views of Levaditi and his colleagues on much the same grounds as Pagniez. Also he had repeated the experiments of Krafft-Ebing, who failed to inoculate parietic patients with ordinary syphilitic virus. He holds that it is rather the change produced in the virus by its happening to settle in the parenchyma of the nervous system which accounts for its different behaviour when inoculated into animals, and for its resistance to antisiphilitic remedies.

The proceedings of the Annual Reunion of the Neurological Society of Paris¹² disclosed a fairly even division on this question of unity or plurality of the syphilitic virus. Amongst others, Mott pronounced in favour of unity, on the grounds that he had failed to note any difference between spirochaetes recovered from sixty cases of general paresis and those found in ordinary syphilis. In juvenile tabes, also, he has always discovered stigmata of hereditary syphilis.

[The strongest argument against the plurality of the syphilitic virus appears to be that a neurotropic virus would die out from failure of opportunity to become transmitted to others.—L. W. H.]

REFERENCES.—¹*Zeits. f. d. g. Neurol. u. Psychiat.* 1919, xvii, No. 5, 385; ²*Presse méd.* 1920, May 8, 281; ³*Brazil Med.* 1920, xxxiv, 167 (abstr. in *Jour. Amer. Med. Assoc.* 1920, July 31, 352); ⁴*Ann. de Méd.* 1920, Jan. (abstr. in *Brit. Med. Jour.* 1920, Aug. 28); ⁵*Brain*, 1918, xli, 255; ⁶*Amer. Jour. Med. Sci.* 1919, Sept., 312; ⁷*Wien. klin. Woch.* 1920, xv, 313; ⁸*Med. Klinik*, 1913, Sept. 21; ⁹*Presse méd.* 1920, May 1, 266; ¹⁰*Ann. de l'Inst. Pasteur*, 1919, xi, 741; ¹¹*Presse méd.* 1920, lii, 513; ¹²*Ibid.* iv, 540.

SYPHILIS, INHERITED.

Frederick Langmead, M.D., F.R.C.P.

L. R. De Buys and Maud Loeber¹ have made an interesting inquiry into the incidence of syphilis in a founding institution. Not only were the children examined with care physically, but their bloods were subjected to the Wassermann test, and luetin skin reactions were also performed. The original Wassermann test was made of each blood, and, in addition, a second test was made by a modification of the original test, one unit of hæmolysin being used instead of two, and the incubation being protracted over a longer period. The readings obtained corresponded in each case. The number of infants and children examined was 106, of whom 57 were males and 49 females, and their ages ranged from 1 month to 5 years and 10 months, with the exception of one child of 7 years. That the Wassermann reactions and luetin test were performed accurately seems to have been established by controls. The luetin test proved of greater value as a diagnostic measure than the Wassermann reaction; the latter was negative in every case, but this might be explained by the intensity of the treatment employed, or by the fact, they think, that the bloods had not yet become positive to the test. The clinical findings were of

greatest use when the value of the luetin test was at its minimum—in the first few weeks. The effect of iodides on the luetin reaction was to produce a characteristic lesion, and one which could not well be confounded with the ordinary positive reaction of syphilis to luetin. As a comparison between the relative values of the luetin and Wassermann reactions the series did not afford a fair test; but, in their opinion, it gave a good idea of their relative values at this time of life, when only those survived who had escaped the early ravages of the disease, and either had been treated or were less severely infected. The existence of syphilitic skin eruptions in cases in which both Wassermann and luetin reactions were negative emphasized the need for employing all available means in the diagnosis. The eruptions were more frequent the younger the subject. Twelve of the 22 instances of syphilitic rashes occurred in children within the first three months of life; in 10 of these the luetin reaction was negative. With very few exceptions all the inmates of the institution were below the normal in weight, height, development, and nutrition. Enlargement of the liver, spleen, and glands appeared to be the most constant clinical evidences of the disease, but the infrequency of the other clinical manifestations—snuffles, fissures, pemphigus, etc.—may well have been influenced by the treatment then in vogue in the institution. The incidence of syphilis was 83 to 96 per cent; 79 cases, or 74.53 per cent, were revealed by the luetin reaction, and 10 cases, or 9.43 per cent, by the clinical findings. It was found relatively more frequently among the illegitimate than the legitimate. Because of the ages of those examined and the character of the institution, the investigation afforded an excellent opportunity of appraising the value of the methods for detecting the existence of the disease in young children under treatment.

Lesage and Kousiansky² have come to the opinion that congenital atrophy is due to inherited syphilis in 25 to 35 per cent of the cases, and obtained a positive Wassermann reaction in this group. When the reaction was negative, they regarded a tuberculous inheritance, physical exhaustion of the family, or acquired infection as responsible. When syphilis is a factor, they give *Neo-arsphenamin* every eighth day, very slowly increasing the dose from 0.0025 gm. to a maximum of 0.01 gm. After six or seven injections they desist for two months, and then repeat the course. These small doses can be begun soon after birth, but should be stopped in the case of fever. This procedure they believe to be the best for latent syphilis in young infants. For the injection they generally use a vein at the elbow, occasionally the superior longitudinal sinus. On the day of the injection the diet is sweetened boiled water only. Both mercury and such large doses of *neo-arsphenamin* as 0.01 gm. per kilogram, as advocated by Blechmann, they regard as unsatisfactory.

Marfan³ discusses the treatment of habitual vomiting in its relation to inherited syphilis. When syphilis is a factor, the infants tolerate *Mercury Lactate* by the mouth better than the other preparations of the drug.

J. Adams⁴ has shown that a syphilitic pregnant woman can be treated safely and effectively with arsenical preparations up to the day of her confinement, and that, if actively treated, she may give birth to a child with a negative Wassermann reaction, although her own blood still reacts positively. The child can thrive if the mother has been treated. If, however, the child is syphilitic when born, it can be treated immediately after birth with safety and considerable benefit. The good results were obtained by intramuscular injections of *Galyl* dissolved in glucose solution, but were considerably enhanced by simultaneous intramuscular injections of *Mercury*, combined with oral administration of *Grey Powder*. The child responds to treatment much more readily than the mother, if one judges by the blood test, and thrives, puts on weight, and becomes quite normal. At a venereal diseases centre for

pregnant women where the treatment has been carried out, none of the babies born during the past year and actively treated has developed any manifestations of syphilis. The initial dose of galyl used is 1.5 cgrm., and is given on the day of birth, and followed by a similar dose a week later. Thereafter the injections are given fortnightly, their effects being controlled by the Wassermann test at intervals. Adams deems it important to give the galyl in glucose solutions. The dose is gradually increased from 1.5 cgrm. to 5 cgrms. The mercurial treatment is begun after the first week, and is given in the form of intramuscular injections of grey oil into the buttock, a special syringe, with fifteen divisions, being used, each division corresponding to one-fortieth of a cubic centimetre. When 40 c.c. of grey oil are injected, then each division contains 1 cgrm. of mercury. The strength of the grey oil used for babies is 20 per cent, and the amount given is raised gradually from $\frac{1}{4}$ gr. to $\frac{1}{2}$ gr. of Hg. It is conveniently injected into one buttock, the other being reserved for the galyl; both injections are given fortnightly. The results obtained can be seen by the following table:—

Year	Syphilitic mothers	Babies with positive W.R.	Babies with negative W.R.	Stillborn
1917-18	28	17*	6	5
1918-19	30	8†	21	1

* 3 died—1 age 6 hours, 1 age 14 days, 1 age 36 days.

† 1 died, age 2 months.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, Oct. 4, 1928; ²*Nourrisson*, 1919, July, 193 (abstr. in *Jour. Amer. Med. Assoc.* 1919, Sept. 6, 797); ³*Ibid.* 203 (abstr. in *Ibid.*); ⁴*Lancet*, 1920, i, 913.

SYPHILIS, MENTAL TROUBLES OF. (See MENTAL TROUBLES OF SYPHILIS.)

SYPHILIS OF SIXTH AND EIGHTH CRANIAL NERVES. (See EAR, INNER.)

SYPHILIS OF THE VULVA. (See VULVA.)

TABES DORSALIS. (See SYPHILIS OF THE CENTRAL NERVOUS SYSTEM.)

TEETH, SEPTIC, IN CHILDREN. (See DENTAL SEPSIS IN CHILDREN.)

TESTICLES, DISEASES OF. *J. W. Thomson Walker, M.B., F.R.C.S.*

In a series of articles Mott¹ describes an important investigation of the condition of the testes in 100 deaths at all ages, from birth to 86, in London asylums and various civil and military hospitals. The development of the testes from birth to puberty was studied, and one of the most striking features was the large amount of interstitial tissue between the seminiferous tubules and the prominence of the interstitial cells of Ledig at birth. At four months the interstitial cells are hardly visible and no lipid granules are seen. Cases dying before puberty of chronic disease (tuberculosis, congenital syphilis) show appearance of complete arrest of development of the seminiferous tubules. Evidence is given to show that the lipid granules seen in the interstitial tissue and in the cells lining the basement membrane of the tubules constitute the raw material from which the nucleic acid necessary for active nuclear proliferation and spermatogenesis is formed. In the healthy individual the heads of the spermatozoa are stained by the basic dye, whereas in persons

dying of various chronic diseases the majority of the spermatozoa are stained by the acid dye, indicative of a death change.

In 66 successive cases of general paralysis, spirochætes were found in an emulsion of the brain; spirochætes were not found in 50 cases in which an emulsion of the testes was examined microscopically. This fact may be correlated with the fact that general paralytics, unless the wives are infected, have healthy children.

Important observations were also made on the condition of the testes in general paralytics, dementia præcox, imbecility, and idiocy.

Torsion of the Spermatic Cord.—O'Connor² records two cases, and reviews the literature. Uffreduzzi believes that the torsion is always produced by contraction of the cremasteric fibres. There must be an abnormal attachment of the testes and deficiency in the gubernaculum, and a capacious tunica vaginalis. The twist itself results from repeated contraction of the bundles of the cremaster muscle, some of which are abnormal. The extent of the twist varies from one-half to two turns, and the site of the twist is always the free portion of the cord which is covered by tunica vaginalis. The cord below the twist and the epididymis are greatly swollen and purplish in colour, the tunica vaginalis is filled with blood-stained fluid, and the testicle is slightly or greatly enlarged. The symptoms commence with pain in the lower groin of the affected side, and this increases progressively. The scrotal contents begin to swell at once, and reach the full size in twenty-four hours. The swelling involves the testicle, epididymis, and the cord to the upper part of the twist, and the outlines become obscured. The testicle is drawn upwards by the shortening of the cord. There are nausea and vomiting and slight rise of temperature, but the temperature, pulse, and leucocyte count do not correspond with the severity of the local condition. The symptoms continue for a long period until the condition is treated by manipulation or operation. In recurring cases there are repeated attacks, resulting in atrophy of the testicle. Detorsion has been successful in a few cases of fully-descended testicle seen early. The testicle is grasped and slowly rotated on the vertical axis, first from within outward. No force should be used. If this fails, or if recurrence takes place, orchidopexy should be performed. A simple incision and suture of the tunica vaginalis is usually sufficient. In an adult, where transposition of the partly-descended testis cannot be accomplished, or in any case where necrosis, gangrene, or persistent circulatory obstruction is present, removal of the testis and the involved portion of the cord is indicated.

Chorio-epithelioma of the Testes.—Jackson³ records a case of this affection, and discusses the condition. More than 80 per cent of solid benign tumours of the testes, he states, have been shown to be teratomas. In the malignant forms, distant as well as regional metastases should be looked for, and to this end an x-ray of the lungs is essential. The finding of a mass in a teratoma which resembles old or fresh blood-clot is pathognomonic of chorio-epithelioma.

Confusion with tuberculosis may arise when a tumour of the scrotum is combined with hæmoptysis (from metastases) and loss of weight.

Acute Encysted Hydrocele of the Spermatic Cord.—Raymond Johnson⁴ refers to three cases that he has seen. The symptoms appeared after exertion, with a sudden pain in the groin and the discovery of a very large tender lump. There was nausea, but no vomiting. Strangulated hernia was simulated, and had been diagnosed in two cases. The swelling was, however, translucent, and the spermatic cord could be grasped between the finger and thumb between the swelling and the external abdominal ring. The author considered that either a sudden exertion had caused an effusion of fluid into the already

present unobliterated portion of the funicular process, or that a small hæmorrhage started the effusion.

Epididymitis.—Vinson⁵ has treated 31 cases of acute epididymitis with the actual cautery. The most dependent portion of the scrotum immediately over the swollen globus minor is held taut and painted with iodine. The skin and coverings are painted with procain. The cautery at white heat is passed through the scrotum into the globus minor and remains for sixty to eighty seconds. Immediate relief is obtained and the reaction is slight. [There is no note as to the probable destruction of the coiled epididymis tube and production of sterility of this testicle by such treatment.—J. W. T. W.]

Hubbard⁶ holds that epididymotomy is imperative in acute epididymitis, and should be performed early. It is advisable also in recurrent and relapsing cases. To prevent post-operative hydrocele, the tunica vaginalis is resected close to the epididymis and drainage is provided. In Hubbard's cases immediate relief of pain followed the operation.

Morveau⁷ advocates surgical treatment of gonorrhœal epididymitis. Local anæsthesia with stovaine is used. A long incision is made into the globus minor and, if necessary, prolonged into the globus major. The globus minor is curetted. The tunica vaginalis is opened, adhesions are broken down, and the sac is resected or reflected. Drainage of the scrotal wound is continued for two or three days.

Varicocele.—Jacob⁸ holds that it is necessary in the treatment of varicocele to correct the elongation of the cord, the low position of the testicle, and the distention of the scrotum. An incision is made similar to, but shorter than, that for inguinal hernia. From 6 to 8 cm. of the varicose veins are resected, the deferential artery being spared. The testicular venous stump is fixed to the pillars of the inguinal ring and the wound closed.

Meaker⁹ describes a modified operation for scrotal varicocele under local anæsthesia. An incision is made over the cord just below the external abdominal ring. The intercolumnar fascia is picked up and nicked, and the cremasteric fascia also nicked. The cut edge of the external spermatic fascia and that of the cremaster are picked up together on each side, and the incision in these structures extended longitudinally for about two inches. The edges of these fasciæ are held apart, and the cord, surrounded by the infundibuliform fascia, is separated. The author rarely does more venous resection than removing three or four of the most dilated vessels. These he ties separately with fine catgut, and does not bring the severed cords together. The cremaster is now shortened by introducing eight interrupted fine catgut sutures longitudinally into the muscle. The four posterior sutures are introduced from within the muscular tube; the four anterior sutures include the intercolumnar fascia and are introduced from without. The sutures are now tied so that the cremaster mass is shortened.

Van den Branden¹⁰ describes a case of spontaneous rupture of a varicocele. There was a sudden severe pain in the scrotum, and the patient, fainted. Great distention of the scrotum was found, with subcutaneous ecchymoses. The consistence was firm, with some fluctuation at one part. Neither the testicle nor the epididymis could be felt. On operation an enormous clot was found in the cellular tissue, and the bleeding veins were discovered.

Finochietto¹¹ finds that the known surgical methods cure the majority of cases of varicocele without producing complications. Complications may be expected: (1) From any operation that does not primarily act against reflux; (2) From any operation which destroys the spermatic artery without previous proof of the existence and sufficiency of collateral circulation; (3) From any ligature placed on the veins of the anterior packet without previous dissection

and separation of the spermatic artery; (4) From any ligature on a vein placed in the vicinity of the testicle by which thrombosis and its consequences may be produced; (5) From any operation sacrificing dilated veins merely because they are dilated, without first verifying the facts regarding reflux. In actual practice the best method is high separation of the spermatic artery, resection of the veins which accompany it, and transperietal transplantation of the anterior packet.

Abnormalities of Position of Testis.—Murard¹² describes the case of a boy of 16 who suffered from intermittent abdominal migration of the left testicle. The organ disappeared into the abdomen about every month, remained there for about five days, and then reappeared. On operation it was found that there was an open processus, and that the testicle slipped along this into the abdominal cavity, invaginating the sac and drawing up the vessels and vas deferens with it.

Fragenheim¹³ performs the following operation in partly-descended testicle. The inguinal canal is laid open and the peritoneum detached from the cord after section of the processus vaginalis. The deep epigastric artery and veins are dissected and drawn aside. The testicle is drawn behind the vessels, and the peritoneum can be stroked off the vas deferens down into the small pelvis. This is facilitated by extreme elevation of the pelvis. The testicle is now brought through the external abdominal ring, and fixed by stitches at the lowest part of the scrotum after dilating the sac.

Glass,¹⁴ after freeing the cord and bringing down the testicle, stitches the cord at as high a level as possible to the periosteum of the symphysis pubis with two silk sutures.

Lotheisson¹⁵ performs the following operation for partly-descended testicle. The incision runs above and parallel to Poupart's ligament, and is carried down to the upper part of the scrotum. The processus vaginalis is separated and the inguinal canal opened. The peritoneal sac is tied and removed high up. The scrotum is dilated with the finger, and the cord carefully stretched until it reaches the lowest point, where it is held by an assistant. The external oblique and the transversalis muscle are now stitched firmly over the cord to Poupart's ligament, the last stitch lying nearer the pubic bone. An olivary bougie may be included alongside it, and is now removed. The scrotal connective tissue and fat are now stitched with Lembert's sutures over the cord as far as the upper pole of the testicle, so that the cord is enclosed in a canal. The skin wound is closed with Michel's clips.

Vesiculae Seminales.—Young and Waters¹⁶ describe the technique that they have developed in injecting the seminal vesicles with thorium and obtaining an x-ray picture. A special x-ray urological table is used, by means of which it is possible to place the patient in any position for radiography without disturbing the patient or the urologist. Geraghty's utricle syringe has a slender tip of 1.5 cm., and it was found, in passing this syringe along the ejaculatory duct until arrested by the shoulder, that the injection always went along the vas deferens, but that with a shorter cannula the injection passed into the seminal vesicles. A special forked cannula, having one branch 3 mm. larger than the other, was devised in order to inject both ducts at the same time. Injection of the seminal vesicles the authors found was without danger. Epididymitis was not observed as a result. The following conditions were suggested as being suitable for application of the method: (1) To determine the patency of the ejaculatory ducts or vas in cases of sterility when epididymo-vasostomy is contemplated; (2) To determine whether stricture of the ejaculatory duct, of the vas, or of the outlet of the seminal vesicle is present; (3) To disclose the condition of the ampulla, or vasa, or seminal

vesicles in inflammatory or tuberculous conditions; (4) To show the condition of the seminal tract in studies to determine the cause of vague pain in the region of the prostate, vesicles, or bladder.

Martin¹⁷ refers to the persistence of gonococcal infection from lesion of the seminal vesicles. The symptoms of vesiculitis are often masked, and the prostate is regarded as the source of infection. The author records seven cases of seminal vesiculitis treated by injection of antiseptic fluids into the vas deferens, a method introduced by Thomas, of Philadelphia. The treatment is based on the fact that when a fluid is injected into the vas deferens in the direction of the outlet of the seminal vesicles, the injected fluid will find its way into the vesicle provided the latter is empty, since the outlet of the vesicle has a larger calibre than the ejaculatory duct. When the quantity of fluid is not large enough to cause contraction of the vesicle, the fluid will remain in the vesicle for a long time. The therapeutic effect is therefore greater than a simple vesiculotomy. The only operation necessary is a small incision in the scrotum to reach the vas. Collargol or some other silver preparation is injected and the wound sutured.

REFERENCES.—¹*Brit. Med. Jour.* 1919, ii, 655, 698, and 737; ²*Surg. Gynecol. and Obst.* 1919, Dec., 580; ³*Jour. Amer. Med. Assoc.* 1919, Dec. 20, 1868; ⁴*Brit. Jour. Surg.* 1920, July, 40; ⁵*Jour. Amer. Med. Assoc.* 1920, Aug. 14, 504; ⁶*Surg. Gynecol. and Obst.* 1920, March, 223 (abstr.); ⁷*Ibid.* 222 (abstr.); ⁸*Ibid.* June, 430; ⁹*Lancet*, 1919, ii, 973; ¹⁰*Arch. méd. Belges*, 1919, June, 683; ¹¹*Surg. Gynecol. and Obst.* 1919, Dec., 472; ¹²*Lyon chir.* 1919, Sept.-Oct., 519; ¹³*Centralb. f. Chir.* 1920, Feb. 21, 173; ¹⁴*Ibid.* 174; ¹⁵*Ibid.* May 3, 442; ¹⁶*Johns Hop. Hosp. Rep.* 1920, Jan., 12; ¹⁷*Surg. Gynecol. and Obst.* 1919, Nov., 396.

THORAX, SURGERY OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Experiences during the war resulted in the surgery of the lungs, pleuræ, and heart taking a rapid stride. Previously the literature was shrouded in mystery, and surgery of a major kind was regarded as adventuresome, and to the mind of the practitioner was outside the realm of justifiable interference. As a matter of fact the removal of foreign bodies from the lung is often an operation of simplicity attended with little or no risk; the exposure and drainage of a lung abscess is in many cases attended with success; and even the removal of a lobe in cases of localized bronchiectasis may be undertaken with confidence.

It is common knowledge that opening the pleura and the production of a pneumothorax accidentally during surgical operations is not followed by any untoward result: the lung collapses, but not completely, and recovers within a week or ten days when the pneumothorax has resolved. It is this collapse of the lung which facilitates the surgeon's manipulations within the chest and allows the lung to be brought forward through an anterior incision and often dislocated through the wound. A bullet or other foreign body can thus be readily felt and removed, the lung replaced, and the wound closed. Care must be taken not to leave a raw surface which may bleed on re-expansion of the lung.

In regard to *abscess*, the x rays will give an accurate localization in many cases; the pleuræ will as a rule have formed adhesions shutting off the main cavity; and when a rib is removed, a forceps can be pushed through the condensed lung tissue until pus is found; adequate drainage is then established. A bronchial fistula may remain, the closure of which is the most troublesome part of the treatment. Where no pleural adhesions exist, the case is more serious, for the escape of pus from the lung may readily be followed by an empyema. To avoid this complication the operation is usually done in two stages. Gauze is packed down to the lung at the site of the proposed incision, and when adhesions have formed the abscess is opened and

drained. The writer has had success in dealing surgically with 'septic' lungs in most unpromising cases. There was unnecessary delay in dealing with some of them; but, as in the case of abdominal surgery, it is becoming generally known that in this field there is now no terror, and the results on the whole are most encouraging.

The advice given about the management of *empyema* is very confusing. An immense amount of literature has appeared since the war. In a general way the observations of the authorities may be summed up as follows: Aspiration has never cured an *empyema*, but may be employed and repeated to tide a patient over a bad crisis, as in the type following influenza pneumonia. Drainage through an intercostal incision may be tried in similar cases where aspiration fails to evacuate the pus in sufficient quantity. Such minor operations should be quickly followed by the removal of a portion of a rib before the lung has lost the power of expansion. Suction apparatus to endeavour to keep up a negative pressure during drainage is troublesome and difficult to manage. A large-sized tube about a foot long connected with a second tube immersed in a basin of solution beside the bed is practically effectual for three or four days, if care be taken to make the wound round the tube air-tight. This can be done with the aid of dental rubber and careful suturing. In recent traumatic cases, especially if there is a 'sucking' wound of the chest as is seen in military surgery, a rib is removed, Tuffier's or other retractor is introduced, and the ribs above and below are widely separated. All blood-clot is wiped out, and the pleural cavity cleaned with eusol or Dakin's solution. The wound is then closed, and aspiration performed at intervals to remove fluid. This treatment is often followed by success, and has the great advantage of avoiding drainage and the risk of a subsequent sinus.

In old-standing cases with persistent sinus, Estlander's operation should only be a *dernier ressort*. If ribs are removed and the chest wall allowed to fall in, all possibility of the lung functioning again is taken away. The operation is mutilating and produces great deformity. It is better to remove one or two ribs, and with Tuffier's retractor view clearly the conditions within. Every pocket is opened up and the false 'felt-like' membrane which covers and holds down the lung should be removed if possible. The lung may commence to expand forthwith. The pleural cavity is then irrigated gently with eusol or Dakin's solution, and, if feasible, tubes to carry the solution to the recesses of the cavity are left *in situ*. Injections are made every few hours. Bacteriological examinations taken from time to time may prove the cavity sterile, and the thorax may then be closed by a plastic operation. Unless with special equipment, nursing, and bacteriology, the Carrel-Dakin treatment is difficult in practice, and in old-standing *empyemata* reliance must generally be placed in removal of the membrane covering the collapsed lung, the opening up of all pockets, irrigation, and adequate drainage.

In an editorial, the *British Medical Journal*¹ remarks that "the war has taught us certain broad principles of chest surgery. We have learnt that the thorax may be opened with comparative impunity, and without the necessity for special pressure chambers and other devices to prevent collapse of the lung. The technique has been simplified so that few special instruments are required, and the resection of four inches of one rib has been shown to be sufficient to give access to any part of the pleural cavity. It has been shown, too, that in injuries causing an open pneumothorax or extensive rib injury, operation is essential. Many lessons as to the treatment of the infected pleura have been learnt, not the least important being that infection with organisms other than streptococci may often be satisfactorily treated by repeated aspiration, or by opening, cleansing, and then closing the cavity and trusting to subsequent

aspiration. This should have an important bearing on the treatment of empyemata, where the slow progress to recovery under drainage, and the resulting lack of expansion, are so frequently a source of anxiety and disappointment. Finally, the results of operating for the late results of infection are full of promise for the future. The operative methods introduced by Tuffier to deal with a collapsed lung bound down by adhesions and thickened pleura have in his hands resulted in restoration to function of a completely useless lung, and may be expected to fructify in a rich harvest of brilliant results. In civil practice a careful application of these lessons will lead to increasing enterprise in dealing surgically with intrathoracic conditions, whilst the military surgeon of the future will find the procedure he must follow firmly established, thanks to the pioneer work of the French and British surgeons in the war. The Statistical Record, evidently compiled with great care by officers with an unrivalled opportunity for collecting figures, and for drawing inferences from them, and also for observation of the actual work performed, will be a valuable guide for the future; and the Medical Research Committee has in it produced a work of lasting utility”.

EMPYEMA.

Acute Purulent Pleurisy.—Villandre² describes the preferable technique for pleurotomy as the proper treatment for purulent pleurisy. The condition of the lung and the general condition must be such as not to contra-indicate the intervention, knowing the exact site of the abscess and draining at the lowest point. Another indispensable precaution is the determination of the micro-organisms involved: the tubercle bacillus contra-indicates pleurotomy, while the streptococcus, associations of germs, and putrid pleurisy demand immediate pleurotomy. Pure pneumococcus pleurisy does not always require pleurotomy. Local anæsthesia is all that is needed, except for restless young children. Rib resection must accompany the pleurotomy to allow removal of the false membranes with pneumococcus or streptococcus pleurisy. Provision for drainage should be ample, but managed so as not to promote the collapse of the lung. Antiseptic lavage or intermittent flushing of the cavity is necessary with the streptococcus or associated microbes or the germs of putrid or gangrenous pleurisy. As soon as the temperature is normal, breathing exercises should be begun and kept up, and the spirometer used, to combat the tendency of the lung to retract.

Chronic Empyema.—Cauchois³ discusses the reasons why empyema has so often resisted all treatment. Defective drainage or a persisting foreign body is usually to blame, a scrap of drain or of gauze, or a chip from an instrument, or piece of suture material—all of these have been found in empyemas. Osteitis of a rib close to the fistula may be a factor, and raying may reveal a second pus pocket. An instructive case is related by Picquet in which an empyema that had lasted for six years healed up at once when a secondary pus pocket in the lumbar region was incised and a long drain passed through this incision and up through the diaphragm into the pleura. The various methods for repair when suppuration has been arrested are compared. The prognosis is much better since Carrel-Dakin irrigation or insufflation of oxygen has been applied to these old cases.

The Immediate Closure of Empyemata.—Frank Hathaway⁴ says; “It stands to reason that the simple resection of rib, letting out of pus, and putting in of a drainage tube is not the ideal and complete treatment of empyema. Something more is wanted, because re-expansibility of lung is far more important than the mere evacuation of pus, and this re-expansibility can only be

produced in two ways: (1) By introducing the whole hand into the pleural cavity and freeing the lung of all adhesions and removing all fibrinous clots; (2) By immediate closure of the wound. Those who have had experience of chest surgery in France learnt that the first thing was to do away with a 'sucking wound'. Why, then, should we by the use of a drainage tube deliberately establish one in the treatment of empyema? By using an open tube the atmospheric pressure in the pleural cavity must be greater than that in a collapsed lung, and in order to get a lung to re-expand as quickly as possible it is essential to produce a vacuum in the pleural cavity. This result can only be attained by immediate closure of the wound, after filling up the cavity with some fluid. Every surgeon in France was surprised to observe how quickly the lung re-expanded after immediate closure for gunshot wounds, and the same holds true for empyemata. Breath-sounds will be heard down to the base of the lung within a few days after operation, and the lung will rapidly push out the fluid left, so that it comes to lie under the skin and can be easily and painlessly evacuated. Therefore we may lay it down as an axiom in chest surgery that the lung will quickly re-expand if only it is given a fair chance. This favourable condition can only be secured by freeing the lung from all adhesions and by closing the wound at once. If these two main rules are carried out, we shall do away with the old-standing cases of empyema which go on from year to year, with collapsed lung and a persistent sinus, and eventually have an enormous Estlander operation performed. Is it too good to hope that this operation will become a thing of historical interest only? There is no reason why a pneumococcal infection should be treated on lines different from a tuberculous infection. In either case, by using an open drainage tube, we are asking for trouble by producing a secondary mixed infection. It is important to note that a careful bacteriological examination is essential in every case of empyema. If pneumococci or pneumococci and staphylococci are present, the wound may be sutured; but if streptococci are present, then I think it advisable to remove the stitches and treat by some open method—that is, Carrel-Dakin, packing with gauze, or by a drainage tube”.

The author describes his method of operation as follows: “I have, since my return from France, sewn up all my cases, and my experience up to date has taught me that the following are the best lines: I have always used a local anæsthetic, but I am inclined to think that when handling the lung a little general anæsthetic with it is useful. I resect sufficient rib, either a long section of one rib or adjacent parts of two ribs, to allow of the introduction of the whole hand into the pleural cavity. This is the first and most important point, because, after evacuation of the pus, it is essential to pass the hand into the chest cavity and strip off the collapsed lung all adherent fibrin, and separate the lung from all adhesions. In any early case this is easily done, but an old-standing one will require much freeing of the lung in order that it may recover its re-expansibility. I then wash out the pleural cavity with flavine till the fluid comes away quite clean, and fill up the chest with a 2 per cent suspension of iodoform in sterilized paraffin. The pleural wound is then sewn up with catgut; not that I think this is very important, because these stitches soon give way. I then carry out immediate closure of the skin wound with deep sutures, so as to leave no ‘sucking wound’. The next important point is the after-treatment. When dressing on the next and following days the wound will be bulging; this is due to a mixture of pus and iodoform and paraffin being pushed out of the pleural cavity by the expanding lung under the skin. Daily I introduce the needle of an exploring syringe between the edges of the wound—this is quite painless—and extract all the fluid I can.

This process usually takes ten to fourteen days, depending on the re-expansion of the lung. Daily bacteriological reports of this fluid show that the number of organisms in a field steadily diminishes. A certain amount of this mixture of pus and iodoform and paraffin will ooze out also into the dressings. The two most important points in technique, then, are—(1) Introduction of the whole hand into the pleural cavity to separate adhesions and remove all fibrin. The lung must be made to re-expand. (2) Daily evacuation by an exploring syringe of the pus and paraffin as it is pushed out under the skin by the re-expanding lung. I have now sutured nine cases. The ages of the patients were 55, 53, 44, 30, 27, 25, 18, 4, and 2½. All were pneumococcal except two; one was staphylococcal as well as pneumococcal, and one which was my only failure; this was a tuberculous case—a man, age 44, with two big abscesses pointing under the skin, one behind and one in front. He was very debilitated and ill. As it was one of my early cases I did not sufficiently explore the chest with my hand; had I done so I should have found, as I did post mortem, that the lung was tied in a knot at the root. I sewed the incision up, and the patient died in twenty-four hours. After seeing the condition of his chest I am quite sure the result would have been the same had I drained with a drainage tube or sewn up. The other eight cases all made good and rapid recoveries. The temperature fell at once, and the pulse and respirations came down more gradually. The duration of the disease in these cases varied from two to six weeks after the resolution of the primary pneumonia. A further suggestion has occurred to me, but I have not lately had an empyema to try it on. It is this: Whether it would not be a good plan to insert into the pleura a soft piece of folded rubber—that is, a passage tube—in order gradually to let out the iodoform and paraffin, and to do away with the daily needling of the collection under the skin. This piece of folded rubber will not allow air to enter the pleura, and will yet slowly allow the escape of pleural contents”.

Bunts⁶ classifies cases of empyema in young adults as follows: (1) Those with clear fluid and no micro-organisms present; (2) Those with slightly turbid fluid and various bacteria—staphylococcus, colon bacillus, or *Streptococcus hæmolyticus*—present; (3) Those with frank yellow pus and with bacteria present. He suggests the following respective lines of treatments:—

1. These were aspirated by the physician in charge, or, upon request, by one of the surgical staff, but were not transferred to the surgical service.

2. These were transferred to the surgical service, aspirated under primary ether anæsthesia, and injected with a small amount of glycerin and formalin (2 per cent solution). They were watched carefully from day to day, and a failure to show improvement or an increase in the severity of their symptoms was followed by immediate operation. About sixteen cases were treated in this manner, of which six or seven recovered without operation. Inasmuch as an occasional case under this classification recovered in which aspiration without the injection of formalin was carried out, it is impossible to say that the latter was a curative agent in the others. All that can be said is that a number got well under its use, and that it did not seem to do any harm in any instance.

3. These were all operated upon within twelve hours after their detection, except—and this the author believes to be of importance—those cases where the high fever and physical signs showed the pneumonia to be still active or invading the opposite side. In these the fluid was aspirated, sometimes repeatedly, until the pneumonic symptoms abated, and then aspiration was proceeded with. It was a self-evident fact in these cases that the empyema was not the determining factor in the critical condition in which these patients found themselves,

and a radical operation, or indeed, any operation other than aspiration, would materially lessen their chance of recovery. This he found to be true, from serious clinical experience.

He thus describes his method of operating: Local anæsthesia over area of rib to be resected, followed by light primary anæsthesia and rapid incision and excision of bone, insertion of a long $\frac{3}{4}$ -in. rubber drainage tube which was sutured into the wound, tight suturing of the wound about it, and a clamp to the tube to prevent escape of fluid. As regards after-treatment, the patient was put in a semi-recumbent position or the head of the bed elevated by blocks, and the tube end inserted into a drainage bottle containing some antiseptic fluid and attached to the side of the bed. The clamp on the tube was opened up for a few moments every half hour, allowing a small amount of fluid to escape until the chest cavity was evacuated and danger of sudden respiratory or circulatory changes eliminated. The clamp was then removed entirely and drainage allowed to continue. At the end of a week or ten days, rarely earlier, the cavity was washed out twice daily with varying solutions, such as iodine, sterile water, normal saline, boracic acid, formalin and glycerin, and at two-hour intervals when the Carrel-Dakin method was used. The large number of cases operated upon gave excellent opportunity to try out a series with each method. In from one to two weeks, when the discharge had greatly diminished, the large tube was removed and progressively smaller short tubes inserted. Blowing into a bottle was insisted upon in every case, but not until the *unaffected side had been carefully strapped with adhesive plaster in a manner similar to that used in fractured ribs*, the object being to prevent emphysema of the well lung, if possible, and to hasten the expansion of the collapsed lung. As soon as the patient was able to be up, light sitting-up drills and breathing exercises were instituted. Beds were moved out of the wards on to the porches, foods were administered as frequently and in as great quantity as the patient could take them. Heroin, and occasionally Morphine, were given during the first two or three days for pain or cough; threatened œdema of the lungs was combated with Digitalis, Atropine, and Oxygen; and in the later stages, Iron, usually in the form of the syrup of the iodide, was given.

ABSCESS OF THE LUNG AND BRONCHIECTASIS.

Green⁶ says in a summary: The diagnosis of a lung abscess, if acute, may be based upon certain factors, a prominent one of which is a fresh rise of temperature. After recession of the temperature come symptoms of increased cough and sputum, and a changing shadow as shown by consecutive *x* rays. The history is that it follows either the inhalation of a foreign body or a pneumonia. The pathology is that of a lung cavity in one side or the other, or possibly on both sides. The physical signs are those of localized consolidation with occasional cavernous breathing and bubbling râles. Clubbing of the fingers is a constant feature. The expectoration is profuse, of a sweetish, foetid odour, rather free from tenacious mucus, and of a greenish-yellow colour. The treatment is chiefly surgical, and consists in removal of a rib or ribs, with drainage of the abscess through an adherent area of the visceral to the parietal pleura. There are certain lung abscesses with thickened walls which may require more extensive surgical treatment. These will probably not be cured by simply draining. They may necessitate the resection of a lobe of the lung. The procedure for draining the lung abscess may be of a one, two, or more stage operation. The first stage may be used as an index of the patient's power of resistance. If operative treatment is refused, or seems unjustifiable, postural treatment may sometimes effect a marked amelioration of the symptoms.

Excision has been especially advocated by Lilienthal⁷ in New York, who has operated in a number of cases. In 1917 he gave the late results in three cases :—

1. A boy, age 6½, had inhaled pieces of a nut at the age of 2½, some fragments of which were removed by the aid of a bronchoscope, but he developed bronchiectasis which involved the whole of the right lower lobe of the lung. This was shown both by *x*-ray examination and by the bronchoscope. The lobe was freed from adhesions, the pedicle ligatured, and the affected lobe removed in 1914. Three years later the boy was in good health, and except for the scar of the incision, the chest wall was perfectly symmetrical and all the movements normal.

2. In a boy, age 10, bronchiectasis had followed pneumonia, and the right lower lobe was proved to be the seat of multiple abscesses. A long incision was made in the 7th intercostal space and the wound retracted without excising ribs. The hilum was crushed, then ligatured, the lobe cut away, and the stump fixed in the parietal wound to prevent retraction into the mediastinum. There was for a time a bronchial fistula, but finally complete healing with a symmetrical chest wall and normal movements.

3. A woman after tonsillectomy developed a pulmonary abscess and bronchiectasis. She brought up as much as a quart daily of foul sputa. The *x* rays showed a dense shadow in the position of the middle lobe of the right lung. In addition to the long incision in the 7th intercostal space, a piece of the 8th rib was excised, and the 6th and 5th ribs cut through behind. Then a large piece of the middle and lower lobes, enclosing an abscess cavity, was removed. There was an immediate cessation of the cough and expectoration, and recovery occurred. A year and a half after the operation there was still a bronchial fistula, the chest movements had been restored, and there was only a slight deformity.

For *x*-ray diagnosis in thoracic surgery see also p. 29.

REFERENCES.—¹*Brit. Med. Jour.* 1920, Jan. 17; ²*Bull. méd.* 1920, Jan. 31, 87 (abstr. in *Jour. Amer. Med. Assoc.* 1920, March 27, 919); ³*Ibid.* 91 (abstr. in *Ibid.*); ⁴*Brit. Med. Jour.* 1920, i, 734; ⁵*Ann. of Surg.* 1920, July, 66; ⁶*Ibid.* 1919, Nov., 539; ⁷*Med. Science*, 1920, March, 602.

THRUSH.

Frederick Langmead, M.D., F.R.C.P.

Steinert¹ has attempted unsuccessfully to transmit the aphthæ of thrush. He found that, in the presence of digestive disturbance, **Washing out the Stomach** with an alkaline mineral water apparently causes the indigestion and thrush to disappear, without the aid of local measures. In other cases he touched the aphthæ with a 1 per cent solution of **Silver Nitrate**, or gave the child a teat dipped in **Boric Acid** to suck. He found this last measure especially useful, attributing some of its value to the mechanical effect.

REFERENCE.—¹*Zeits. f. Kinderheilk.* 1920, May, Nos. 1-3.

TIG DOULOUREUX. Electrotherapy advocated by Sloan (p. 38). (See also NEURALGIA.)

TICK FEVER.

Sir Leonard Rogers, M.D., F.R.S.

F. D. Nicholson¹ records his experience of tick fever in Palestine, where relapsing fever was prevalent after the advance from Gaza, but after seven days' initial fever the relapses only lasted a day or two, three or four of them being common. Only one death occurred in several hundred cases. The tick, *Argas persicus*, was found and identified by some of the fever patients as having bitten them before they were attacked by fever.

REFERENCE.—¹*Brit. Med. Jour.* 1919, ii, 811.

PLATE XXXIX.

CANCER OF THE TONGUE

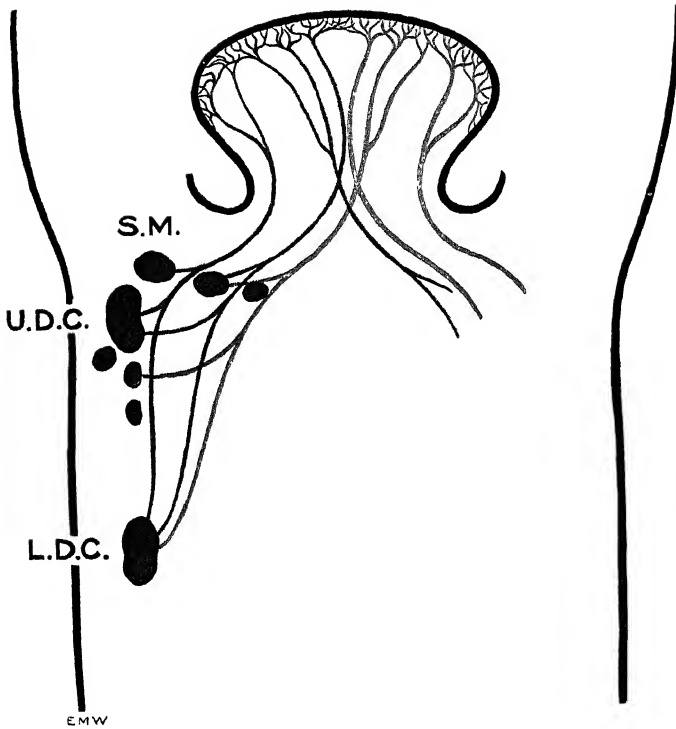


Diagram to show course of the central lymphatic vessels of the tongue to glands on both sides. S.M., Submaxillary glands. U.D.C., Upper deep cervical glands. L.D.C., Lower deep cervical glands.

By kind permission of the 'British Journal of Surgery'

TINEA IMBRICATA. (*See FUNGI, THE HIGHER, IN HUMAN DISEASES.*)**TONGUE, CANCER OF.** (*See also CANCER.*)

Sir W. I. de C. Wheeler, F.R.C.S.I.

Jamieson and Dobson¹ believe that cancer of the tongue leads to invasion of the lymphatic glands at a very early stage. Early diagnosis and operation must be supplemented by a more complete removal of the lymphatic glands. The glands liable to invasion even in very early cases are the submental group midway between the jaw and the hyoid bone; they are usually three or four in number, but may be absent. The submaxillary group lie between the salivary glands and the lower border of the jaw; there are usually three, one at the anterior extremity of the salivary gland, one in front of and one behind the facial artery as it reaches the bone. The deep cervical glands lie in relation with the great vessels, the majority are under the cover of the sternomastoid muscle, but the obliquity of this muscle partly exposes the lower glands above the clavicle. At operation there should be a block-dissection of the neck as described by Crile. The complete block-dissection consists in removing in one mass the sternomastoid muscle, the internal and external jugular veins, a considerable area of the deep fascia of the neck, and the lymphatic glands just mentioned. The dissection is done from below upwards. The sternomastoid is divided just above the clavicle; the external and internal jugular veins and all the structures to be removed are stripped upwards from the deeper muscles. The submaxillary salivary glands must be removed. It is only when cancer attacks the lateral border of the tongue that the gland involvement is found on the same side of the neck. A bilateral operation is therefore indicated in growths (1) of the tip of the frenum, (2) of the dorsal surface, (3) of the middle line and back of the tongue (*Plate XXXIX*). The writers of the paper state: "We have had experience of cases where the patient has refused the bilateral operation, and in every instance disease has appeared in the glands of the opposite side". It is believed that the proper operative procedure for early growths of the lateral border of the tongue is a unilateral dissection of the neck with intrabuccal excision of half of the tongue at one sitting. In certain cases the intrabuccal operation should be done first and the gland operation at a later date. In cases of early growth of the tip and frænum, or of the dorsum of the tongue, a unilateral block dissection with intrabuccal excision of the tongue should be practised at one sitting, followed later by a block-dissection of the other side of the neck. The internal jugular vein should be preserved in the second block-dissection.

Norgate² recommends the injection of a phial of **Pituitary Extract** into the growth of the tongue and floor of the mouth, when the disease is inoperable and far advanced. In one case there was a decided decrease in the size of the involved lymphatic glands and no further enlargement of the growth; the condition of the patient remained improved after further weekly injections for nine months, when secondary growths appeared in the liver. In a second case there was a large growth underneath the tongue, extending up the left side of the lower jaw and forming a fungating growth in the neck. There were severe and repeated hæmorrhages. The growth diminished in size, and hæmorrhage was checked, by similar injections of pituitary extract. Following the injections, the patient had severe pain down his spine and became very pallid, but these symptoms only lasted about two minutes. Any suggestion for the relief of these terrible cases is of value. The patients described by Norgate were obviously beyond help from radium or other means.

REFERENCES.—¹*Brit. Jour. Surg.* 1920, July, 80; ²*Brit. Med. Jour.* 1920, ii, 279.

TONSILS, DISEASES OF THE.

A. J. Wright, M.B., F.R.C.S.

Although enlarged tonsils and adenoids are such a common disease, the etiology is still unknown. Leathart¹ claims that the condition is highly infectious, being due to an organism, possibly the pneumococcus. The infective nature of the condition is shown by its greater relative incidence in school children than in other children, by its spread from the first case in a family to previously healthy brothers and sisters, and by the fact that organisms are always present in the nasal and post-nasal secretions of individuals with this complaint but not in normal individuals. Any case once infected becomes a chronic 'carrier', hence the great prevalence of the disease. Complete removal of tonsils and adenoids results in a cure in the majority of cases. Preventive measures are urgently required in view of the widespread occurrence of the disease and the severity of its complications. It is suggested these measures might develop along the lines of open-air schools and vaccination.

Of the suggested alternatives to operation, 'nasal drill' has recently been supported. Hickling and Lapage² describe the routine of the method and its results. The children are arranged in classes of about twenty. Each is given a soft paper handkerchief. The drill is then carried out 'by numbers'. It consists in rhythmically blowing down the nostrils, at first both together, and then either nostril alternately, the bridge of the nose being supported by finger and thumb of the right hand, and the right arm and head being lowered with each blow. The secretions are caught in the handkerchief held in the left hand, and subsequently burnt. A series of these 'pumping' exercises is made to alternate with bouts of sneezing induced by the use of a menthol snuff with a soap basis. Finally, nasal-breathing exercises are carried out. While it was not found that this treatment produced any local reduction in the lymphoid hypertrophies, the general physique was much improved and the nasal discharge and other symptoms were much diminished. The method is of use in cases in which operation is inadvisable, in cases of slight hypertrophy but with a considerable inflammatory element, and as a post-operative measure.

Operative Treatment.—The Sluder method of complete removal of tonsils with the guillotine seems to be the established method in children in the practice of the majority of operators. In adults enucleation by dissection is frequently necessary. Attention is now directed to perfecting technique and to consideration of complications. A method of controlling hæmorrhage after removal of the tonsils is described by Parkes,³ as follows. Two instruments are needed, namely, a curved and a straight 6-in. pressure-forceps. The straight forceps is armed with a catgut ligature 12 inches long held at the tip of the forceps. The curved forceps is applied to the bleeding vessel, and then twisted about 180° to free it from the surrounding tissues. It is held in this position by an assistant. The straight forceps with the ligature is taken in the right hand, the other end of the ligature being held in the left. The ligature is now passed round the curved forceps and hooked over the point, this being done with the straight forceps, not with the finger. The end of the ligature held in the forceps is now brought out of the mouth, the ligature easily tied round the vessel, and the curved forceps removed.

Tonsil in Relation to Infectious Processes.—The relation between infections in the tonsils and other masses of lymphoid tissue and general systemic and focal infections, in spite of much research work, is still obscure. Davis⁴ gives the results of studies on the tonsils in normal persons, in so far as they throw light on this question. These, briefly summarized, are: Lymphoid structures attain their maximum distribution at the two points in the alimentary tract, —namely the throat and ileocæcal regions—in which the normal bacteria are most abundant and in which the greatest number of pathogenic micro-

organisms attack the body. The significance of these lymphoid accumulations would seem to be that of a protective mechanism against bacterial absorption. Apparently, however, in many instances organisms become adapted to attack those very tissues which were designed to protect the body against invasion.

The presence of plasma-cells under the tonsillar mucosa, which are constantly found shortly after (though not before) birth, indicates a chronic absorption of infectious material in all cases; such absorption should not, however, be interpreted necessarily as a pathological process. The tonsils normally have a restricted flora, and certain organisms injected into the crypts disappear in a few days. As normal inhabitants of the crypts, actinomyces-like granules, composed of fusiform bacilli, streptococci, and spirochaetes growing together, are found. This may be an important source of organisms found in Vincent's angina and mouth infections. In the tonsillar crypts *Str. haemolyticus* is almost constantly found, and this focus is the probable source of these organisms when found in the throat and adjacent structures. Tongs,⁵ investigating the presence of *Str. haemolyticus* in the throats of individuals, on the one hand, whose tonsils were present, and, on the other, whose tonsils had been completely removed, obtained figures strongly supporting this view that the tonsils are the focus in which these organisms have their breeding-place. Thus, in the former group, 67 per cent of cases gave positive cultures, while in the latter group the percentage was less than 4.

REFERENCES.—¹*Brit. Med. Jour.* 1920, i, 217; ²*Ibid.* 147; ³*Surg. Gynecol. and Obst.* 1919, Nov., 515; ⁴*Jour. Amer. Med. Assoc.* 1920, Jan. 31, 317; ⁵*Ibid.* 1919, Oct. 4, 105.

TRACHEOTOMY.

A. J. Wright, M.B., F.R.C.S.

The actual opening of the trachea produces so much reflex cough, with resultant hæmorrhage and risk of aspiration of blood, that this stage of the operation is liable to be both disturbed and dangerous. StClair Thomson¹ has for many years employed a preliminary injection of cocaine into the trachea to obviate these difficulties and obtain a 'tranquil tracheotomy'. He gives credit for the original idea to Crosby Green. The method employed is as follows: When the tracheal rings have been exposed, 5 to 15 min. of a 2.5 per cent solution of cocaine are injected into the tracheal lumen between two rings with an ordinary hypodermic syringe (*Fig. 57*). The syringe is so held that the forefinger resting on the needle prevents the point from entering further than about half an inch. A short spasm

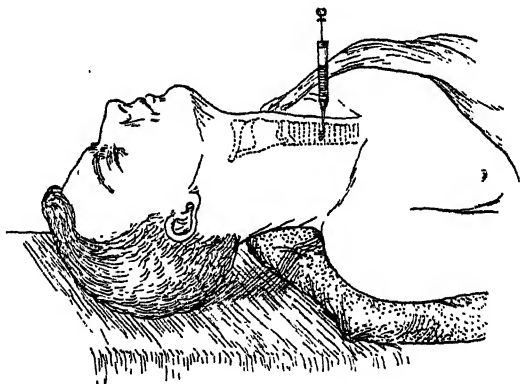


Fig. 57.—Tracheotomy. Injection of cocaine within the lumen of the trachea.
(Redrawn from 'The Journal of the American Medical Association'.)

of coughing results, but this soon subsides. After an interval of about ten minutes, which can be employed in stopping bleeding, preparing tube, etc., the trachea can be opened and the tube inserted in absolute tranquillity. The method can be used under either general or local anæsthesia. [Anyone

A monkey was also infected from the second patient. They also found the same trypanosome in the insect *Rhodnius prolixus*, which is the carrier of the disease in Venezuela. The Brazil carrier, *Conorhinus megistus*, does not exist in Venezuela.

REFERENCES.—¹*L'Encéphale*, 1919, Dec., 311; ²*Lancet*, 1919, i, 829; ³*S. Afric. Med. Jour.* 1919, 326; ⁴*Brit. Med. Jour.* 1920, i, 702; ⁵*Lancet*, 1920, ii, 178; ⁶*Surg. Gynecol. and Obst.* 1920, 111; ⁷*Anales de la Direccion de la Sanidad Nacional*, 1919, Jan.—June, 97.

TUBERCLE BACILLI IN TISSUES.

O. C. Gruner, M.D.

Haswell Wilson¹ describes a process for isolating tubercle bacilli from tissues in such a way as to be able to obtain cultures. The material is rubbed up with dry sterile quartz sand, and the mixture is then washed with sterile saline. The supernatant fluid is pipetted off and thoroughly mixed with antiformin. In fifteen minutes the sediment is obtained by high-speed centrifugalization. This is again washed in saline—three times in all. The final sediment may be injected into a suitable animal, or may be planted on a modified Dorset's medium, full instructions for making which are given.

REFERENCE.—¹*Brit. Med. Jour.* 1920, i, 146.

TUBERCULOSIS. (See also ANUS, TUBERCULOSIS OF; ERYTHEMA NODOSUM; INFECTIOUS DISEASES PREVENTION; SKIN DISEASES, MISCELLANEOUS.)

TUBERCULOSIS, PULMONARY. (See also INFLUENZA.)

Arthur Latham, M.D., F.R.C.P.

Etiological Studies in Tuberculosis.—Lawrason Brown and others,¹ as a result of tests with guinea-pigs, state that their experience tends to belittle the possibilities of danger of infection with tuberculosis from dust of rooms in a health resort, from telephone receivers, from properly cleansed eating utensils, from infected hands through hand-shaking, from knobs of doors, or from infected flies. On the other hand, it seems to confirm the danger by kissing, or the transference of tubercle bacilli to eating utensils and thence, if not cleansed properly, to a second person.

Pregnancy in Tuberculosis.—Sabourin² states that women with chronic tuberculosis who have passed safely through several pregnancies are usually of a dry, muscular, nervous type. Tuberculous women in whom the disease is rendered acute by parturition are those with a comparatively recently acquired infection, and in whom the lesions are subactive.

Winter³ has found that the influence of pregnancy on tuberculosis varies considerably. Examination of 29 women with latent tuberculosis by his assistant Sachse for six months after termination of pregnancy showed that in 82.6 per cent no aggravation of the disease had been produced by pregnancy, but that the patients had improved after delivery had taken place normally. Pankow also found that in 29 women with latent tuberculosis, 84.2 per cent showed no aggravation of their disease as the result of pregnancy. Similar statements with regard to pregnancy and latent tuberculosis are made by other writers, so that it is generally agreed that abortion is contra-indicated in latent tuberculosis. The prospect of the disease remaining stationary when the process is no longer latent is by no means so favourable. Sachse found that in 46 per cent of such cases there was an aggravation of the disease, and that some of the patients died, especially those in whom tuberculosis was advanced. In cases of active tuberculosis better results are obtained by performing sterilization at the same time as the induction of abortion than by the induction of abortion only. Winter, however, maintains that sterilization

for progressive tuberculosis should only be carried out if fresh pregnancies are to be expected and the conditions necessary for recovery are not available.

Elliott⁴ comes to the following conclusions:—

1. Tuberculosis of the lung exerts practically no influence against conception.

2. It seems to exert little influence on the course of pregnancy, and unless the patient is in a far-advanced stage of the disease, it has little or no tendency to cause abortion, miscarriage, or premature labour.

3. Pregnancy may prove a dangerous complication in tuberculosis of the lung, especially if the disease be active.

4. A woman with active tubercle of the lung should not marry.

5. A tuberculous woman should not become pregnant unless her lesion is limited and active signs have been absent for at least two years.

6. There are no rules we can follow which will aid us to determine with certainty which cases will bear the added strain of pregnancy well and which badly. It is equally difficult to determine in what cases an abortion will improve the future prospects of the pregnant woman. As in all forms of treatment of tuberculosis, we must individualize; all rules fail.

7. Intervention after the fifth month rarely gives satisfactory results. Prior to the fourth month, it is possible that the mother's future may be improved by emptying the uterus through the modern operation of vaginal hysterotomy under gas-and-ether anaesthesia—that is, by avoiding shock incident to a prolonged operation, or ordinary anaesthesia, or loss of blood.

8. Labour should be made as easy as possible. The induction of premature labour two weeks before term may be advisable.

9. The tuberculous mother must not nurse her child.

10. The ordinary hygienic and dietetic treatment of tuberculosis must be strictly observed during pregnancy and the puerperium for at least six weeks after all evidence of pulmonary activity has subsided. The obstetrician and the internist should work in closest co-operation.

11. A pregnant woman giving a history at all suggestive of pulmonary tuberculosis should be subjected to a thorough examination by a competent internist at the earliest possible date. Only in this way can the proper treatment be instituted at the time when it is most valuable.

DIAGNOSIS.

The Albumin Reaction in Sputum.—Durand⁵ holds that the presence of albumin in the sputum does not possess any special diagnostic value in pulmonary tuberculosis, as he has found it in cases which have proved to be free of this disease by clinical and laboratory tests. It was present in 15 cases of nasopharyngeal catarrh, 8 of lobar pneumonia, 10 of bronchopneumonia, 4 of acute pulmonary congestion, and 10 of passive pulmonary congestion secondary to heart disease. On the other hand, the test is of prognostic value, as a positive reaction in a tuberculous subject indicates activity of the morbid process, the quantity of albumin being related to the extent of the lesion.

Salamon⁶ regards the test as very important for the detection of incipient tuberculosis. Negative findings, he holds, positively exclude tuberculosis, whereas the amount of albumin is a gauge of the severity of the disease. The albumin can be precipitated out by heat after getting rid of the mucin with a little acetic acid and filtering; or with potassium ferrocyanide and heat; or with nitric acid alone.

Tuberculin Tests.—Calmette⁷ states that at least 95 per cent of adults in

the large towns in France give a positive response to the skin and intradermal tests, which are useful in children and especially young infants, as in these they demonstrate that the case is one of recent infection.

W. A. Muir⁸ comes to the following conclusions as a result of investigations of von Pirquet's tests in 100 cases: *In adults*: (1) That the von Pirquet test is of little value as a diagnostic and prognostic agent, except in a very limited number of cases; (2) That a negative reaction is no proof that a patient is non-tuberculous; (3) That a negative reaction may be obtained in advanced cases, but that a markedly positive reaction does not necessarily indicate a good prognosis; (4) That the reaction is always positive when tubercle bacilli are present in the sputum, except in advanced cases. *In children*: (5) That the reaction may be negative in 30 per cent of children with pulmonary tuberculosis; (6) That after sanatorium treatment the percentage may be reduced to 17, the reduction indicating an improvement in the immediate prognosis.

Donald Luker,⁹ as a result of investigations of von Pirquet's test with $\frac{1}{1000}$ to $\frac{1}{10,000,000}$ c.c. of Koch's old tuberculin, holds that, by using it in different dilutions, he is able to differentiate cases into four groups: (1) Clinically active tuberculosis; (2) Doubtful; (3) Quiescent; (4) Non-tuberculous. His experience is that cases reacting to only $\frac{1}{10,000}$ c.c. and more of old tuberculin, excluding dying cases, are either non-actively tuberculous, or if they have been infected in the past, the tubercle bacilli in their tissues are not active participants in the morbid conditions under investigation.

Thomas Beattie¹⁰ states that he no longer uses tuberculin with the methods of von Pirquet, Moro, or Calmette, owing to the fact that a local reaction in itself does not distinguish between an old arrested focus and a recent active lesion. He uses instead Koch's tuberculin T.A. in 1-1000 solution. He gives 1 c.c. hypodermically, and states that if the reaction is positive there is not only local reaction at the site of inoculation, and a general reaction indicated by some elevation of temperature—which should be taken every two hours—but a focal reaction indicated by increased audibility of crepitations at the site suspected.

Investigations made by Schmidt and Kraus¹¹ in Prague tend to confirm Mathe's statement in 1895 that every reaction to injections of tuberculin would also be provoked by deuterio-albumoses, for they find that the injection of milk evokes responses closely resembling the reaction to tuberculin. The injection of 0.5 to 2 c.c. of boiled milk invariably provoked general, local, and focal reactions, and the temperature may rise to 102°. The chest signs may increase considerably, and be accompanied by pain. The negative phase is followed by a positive phase, as a rule within twelve hours.

Brown and Heise¹² investigated the use of subcutaneous tuberculin tests with Koch's old tuberculin in 324 patients. In two instances tubercle bacilli occurred in the sputum for the first time immediately after the test. Over 90 per cent of 75 patients with a history of hæmoptysis reacted to the tuberculin test; 90 per cent of 144 patients with dry pleurisy, and 90 per cent of 10 patients with pleurisy with effusion, reacted positively. Of 268 patients, only 48 showed an increase of râles during the reaction, and 21 a decrease. The authors hold that the subcutaneous tuberculin test, when positive, proves tuberculous infection, and when accompanied by definite clinical changes, and especially an increase of Röntgen-ray changes during the reaction, indicates that the lesion is more accessible to circulatory changes, and therefore less firmly cicatrized.

A New Cutaneous Reaction.—Guye¹³ brought forward evidence to confirm Wildbolz's work showing that the urine of tuberculous persons invariably sets

up a local reaction at the point of injection in the case of themselves or others suffering from this disease, provided it is active. When tuberculin has been used, the urine test fails to appear, but if tuberculin is used in the near neighbourhood after a positive intradermic urine inoculation, the site of the latter is once more activated.

Tuberculides in Recognition of Obscure Tuberculosis.—J. H. Stokes¹⁴ states that, while the tuberculous character of tuberculides may be regarded as still open to discussion, the demonstration of their constant association with tuberculosis is now so nearly complete that the occurrence of typical lesions of any one of the various types of tuberculides has a high diagnostic value in the recognition of obscure forms of systemic tuberculous infection. An analysis of a group of patients in the Mayo clinic has suggested the close association which may exist between erythema nodosum and purpura, and the papulonecrotic tuberculide. The records of the clinic now include a necropsy in a case of erythema nodosum in which death resulted from miliary tuberculosis, and yet no evidence of the existence of any focus of infection other than the tuberculides could be identified. Tuberculides, because of their close association with lymph-gland tuberculosis, are often of service in the identification of the tuberculous character of adenopathies, mediastinal glandular enlargements, tuberculosis of the uterine adnexa, etc. The occurrence of a partial positive Wassermann reaction in association with tuberculides, in the apparent absence of syphilis, has been noted. In a study of the diagnostic errors occurring in connection with tuberculides, it was found that only 17 per cent were diagnosed correctly. Tuberculosis was not suspected from the cutaneous findings in any case; one-third of the tuberculides were ignored as being insignificant; two-thirds of the mistaken diagnoses were given as syphilis. Syphilis was most often suggested by scars, arthritis, and myalgic pains, with anaemia; one-fifth of the patients had sustained needless surgical procedures. The occurrence of false therapeutic effects due to the action of arsphenamin in these cases still further increases the possibility of a mistaken diagnosis. The appearance of a tuberculide in an otherwise seemingly healthy individual should be the signal for a searching clinical and Röntgenographic examination for a focus of tuberculosis.

PROGNOSIS.

The Prognostic Importance of Tuberculosis of the Larynx.—Sir StClair Thomson,¹⁵ in analyzing cases which have been examined by him at the King Edward VII's Sanatorium for a number of years, comes to the conclusion that the presence of tuberculosis of the larynx raised the percentage of deaths in persons suffering from pulmonary tuberculosis, in a three- to seven-year period, from 39.7 per cent where the larynx was not involved to 69 per cent where it was involved. Put in other words, amongst all the fairly early cases of pulmonary tuberculosis admitted to the sanatorium, the expectation is that 60 per cent of them will be alive three to seven years later, but of cases where the larynx is involved, only 30 per cent will be alive at the end of that period.

TREATMENT.

Vaccination against Tuberculosis.—Maragliano¹⁶ reports on the results obtained by him of **Vaccination** in children and others against tuberculosis, which he has been advocating for twenty-five years. He aims to produce a minute focus by subcutaneous injections of dead tubercle bacilli. The vaccination was applied to 3702 members of families with tuberculosis between 1907 and 1914. The later history of 1893 is known to date (1915); of this number

1819 were living and 63 had died from other than tuberculous processes, and only 11 had died from tuberculosis. All those vaccinated in 1907 were found to be in good health to date. In 26 amongst the earliest vaccinated recently re-examined by a naval medical officer, all were in robust health, while the deviation of complement test revealed persistence of immune principles with predominance of antibodies.

Efficacy of Epinephrin in Treatment of Night Sweats.—According to Takaki,¹⁷ Epinephrin has an absolute value in the prevention of night sweats in tuberculous cases. Its efficacy lasts for three days. Individual hypersensitiveness may be prevented by administering it in 10 c.c. of physiological sodium chloride solution. If after the first injection there is no improvement, the same quantity may be given after an interval of one day. By the third injection, and in increased doses, the ultimate result is often obtained. The author gave 0.7 c.c., but thinks much larger doses are permissible. Diabetes, myocarditis, and pulmonary hæmorrhage are contra-indications.

Artificial Pneumothorax.—G. Lucas¹⁸ reports a case of the successful use of the introduction of nitrogen to separate the inflamed surfaces of the pleura in a case of long-standing dry pleurisy in which ordinary methods had failed to produce improvement, and in which persistent pain was interfering with the patient's progress.

Rautenberg¹⁹ used artificial pneumothorax to arrest hæmoptysis in two men, age 50. In both instances hæmoptysis was stopped, but the men soon suffered from dyspnœa, and the heart became progressively weaker; death occurred on the twelfth and fourteenth days. In each case the chest was barrel-shaped, with rigid walls, and there was a tendency to emphysema of the lungs.

H. F. Gammons,²⁰ as a result of his experience, contends that children and old patients are not good subjects for this method of treatment, and thinks that subjects of cardiorenal vascular disease should be excluded. He has found that the treatment of left-sided cases is less hopeful than that of right-sided cases. In nearly half the left-sided cases he has found marked displacement of the heart, and in many vomiting occurred, apparently owing to pressure on the stomach. In a few instances the left-sided cases experienced severe headache. In 20 per cent of his cases pleural effusion occurred, which in a number of instances became purulent.

Holmboe²¹ states that failure to obtain the desired effects in pneumothorax therapy is largely due to adhesions between the lung and chest wall. In a certain proportion of cases these adhesions may be divided and complete collapse of the lung effected by the combined method of thorascopy and galvano-cauterization devised by Professor Jacobæus. The technique of this method is described, special difficulties and complications are discussed, and details of 9 cases are given. Since this method was adopted at Mesnalien Sanatorium, every case treated with an artificial pneumothorax has been examined with the thoroscope, and of 27 thus examined, 9 cases were selected for cauterization. In 5 of these striking improvement was effected, and in 2 others there was some improvement.

Cetrangolo²² appeals for greater publicity for the disagreeable by-effects in the application of artificial pneumothorax. In his extensive experience there have been cases in which hæmoptysis, subpleural and subcutaneous emphysema, secondary valve formation, and gas embolism developed. The case of gas embolism was due to gas being allowed to enter the needle before the manometer fluctuated. The patient complained at once of intense pre-cordial pain and numbness in the arm, and became unconscious, with complete arrest of the heart action and breathing. Under treatment, however, he

recovered. The symptoms from secondary valve formation are those of progressive suffocation, an opening allowing the gas to pass, but a valve shutting off its return. Intense pain at the site of the insufflation, and progressive dyspnoea half an hour to two hours afterwards, made it necessary to puncture in order to release the gas, unless relief was obtained by spontaneous subcutaneous emphysema. Hæmoptysis may be due to pricking a blood-vessel, or to a focus of the other lung being affected by traction, or to inadequate compression. In one case severe hæmoptysis followed insufflation of 300 c.c., but it ceased when the amount was increased.

Crockett²³ describes certain difficulties which were met with in some 3000 injections, in addition to the complication of pleural effusion. A patient gave signs of collapse an hour after an injection. He suffered severe pain in the side, became cyanosed, and had a pulse of 140. This was due to the escape of some perchloride of mercury solution from the manometer tube into the pleural cavity. A patient, on whom artificial pneumothorax was used to stop a hæmorrhage, had 1450 c.c. injected. Within a quarter of an hour she was cyanosed, pulseless, and the extremities cold. Her condition was apparently due to the fact that the air had become heated in the pleural cavity, and had expanded. A needle was thrust into the pleural cavity, and pressure relieved. A patient during insufflation complained of a peculiar sensation behind the sternum. He felt as if he were going to choke. His condition was attributed to an air embolism. However, he made a good recovery. Two patients suffered, as a result of the introduction of gas, from cardiac asthma. Three patients suffered from surgical emphysema. Another patient developed a spontaneous pneumothorax due to the rupture of adhesions. A patient in whom dyspnoea was marked had a needle inserted into the sixth interspace in the mid-axillary line. It showed a positive pressure of 4, which became negative almost at once and stayed at minus 4. As she complained of pain in the back and a peculiar sensation, the needle was at once removed and no gas was injected. Respirations ceased almost at once, and death ensued. It was apparently caused by air in the 8 cm. of $\frac{1}{4}$ -in. glass tubing being sucked into the lung. A post-mortem examination showed little air-bubbles in the superficial vessels of the brain, indicating that death had resulted from an air embolism.

Thoracoplasty.—Saugmann,²⁴ reporting on his experience on Sauerbruch's operation of thoracoplasty, in which portions of the hindermost pieces of the ribs only are removed under local anæsthesia, states that of 40 cases operated upon, all of them severe, and in all of which artificial pneumothorax had failed, 13 are now able to work, though 6 of these are only capable of light work. He gives full details of the technique of the operation and of the local anæsthesia. Chronic fibroid cases, without severe acute symptoms, with more or less extensive cavities, are particularly suitable for the operation. Cases of a sclerosing or destructive character in the lower lobe are also favourable.

Bull²⁵ has done a thoracoplastic operation in 37 cases of pulmonary tuberculosis, and he tabulates the details and outcome in all. The mortality was 30 per cent in his earliest 11 cases, but since then only 4 per cent, and he ascribes this improvement to his practice of doing the operation at two sittings, with an interval of three or four weeks between them. Of the 33 who survived the operation, 7 died later from the progress of the tuberculosis—one surviving for four years—and 1 succumbed to influenza; but 25 are still living, and 11 of these can be regarded as cured, with full earning capacity; 7 still show symptoms; and in 7 the interval since the operation is too short for determination of the outcome, but most of them regard themselves as cured. A very favourable result was thus realized in over 83 per cent of 30 patients,

including a number with an interval since of almost five years. When there is a cavity, he aids the 'collapse therapy' by implanting a piece of adipose tissue, cut to fit from the abdominal wall.

Willy Meyer,²⁸ in a critical review of the operative treatment of advanced pulmonary tuberculosis, gives the history of thoracoplasty since Friedrich's address in 1911. He emphasizes the necessity for the continuous attendance of trained nurses; for, next to careful aseptic work under regional and local anæsthesia, the success of the operation depends largely on most vigilant and efficient nursing and constant intelligent supervision of the patient during the first few days after the operation. He has performed the operation in some cases, in preference to lobectomy, in patients suffering from bronchiectasis, as well as in patients suffering from advanced pulmonary tuberculosis.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, Nov. 22, 1576; ²*Médecine*, 1920, May, 478; ³*Med. Klinik*, 1919, xv, 727; ⁴*Canad. Pract. and Rev.* 1920, Aug., xlv, No. 8; ⁵*Med. Science*, 1919, Nov., 165; ⁶*Médecine*, 1920, May, 508; ⁷*Ibid.* 461; ⁸*Brit. Jour. Tubercul.* xiv, No. 3, 120; ⁹*Med. Jour. of Australia*, 1920, June 12, 548; ¹⁰*Brit. Med. Jour.* 1920, i, 112; ¹¹*Med. Science*, 1920, Jan., 365; ¹²*Jour. Amer. Med. Assoc.*, 1920, July 31, 342; ¹³*Rev. méd. de la Suisse Rom.* 1919, Oct. 10; ¹⁴*Jour. Amer. Med. Assoc.* 1920, Jan. 24, 278; ¹⁵*Lancet*, 1919, ii, 689; ¹⁶*Jour. Amer. Med. Assoc.* 1919, Sept. 13, 871; ¹⁷*Ibid.* Oct. 18, 1246, and *Japan Med. World*, 1919, Aug. 31, 298; ¹⁸*Brit. Med. Jour.* 1920, April 3; ¹⁹*Zeits. f. Tuberkul.* 1920, April, xxxii, No. 1; ²⁰*Boston Med. and Surg. Jour.* 1919, clxxx, 528; ²¹*Tubercle*, 1919, Oct., 9; ²²*Jour. Amer. Med. Assoc.* 1920, March 20, 836; ²³*Edin. Med. Jour.* 1920, Aug., 113; ²⁴*Tubercle*, i, No. 7, 305; ²⁵*Jour. Amer. Med. Assoc.* 1919, Dec. 20, 1910; ²⁶*Surg. Gynecol. and Obst.* 1920, Feb., 161.

TUBERCULOSIS OF THE SPLEEN.

Herbert French, M.D., F.R.C.P.

Whether or not H. Z. Giffin's¹ views in regard to tuberculosis of the spleen will be confirmed by others remains to be seen, but he is of opinion that primary tuberculosis of the spleen is far less rare than has been supposed. He does not refer to the miliary tubercles of the spleen occurring in association with generalized miliary tuberculosis—a condition which is very common in children—nor to caseous tuberculous trouble in the spleen in man—which is much rarer—but to chronic enlargements of the spleen associated with clinical manifestations of hæmolytic jaundice, or of acute aplastic anæmia; and he states that, from the standpoint of diagnosis, tuberculous splenitis should be considered in conditions in which the findings are not clearly those of some other disease, and that primary tuberculosis of the spleen may simulate pernicious anæmia. The kind of cases he refers to are those in which splenectomy affords great benefit to the patient, or even apparent cure; but it is not quite clear from his writing how he establishes with certainty the tuberculous part of his diagnosis. When one can have tuberculous lesions confined to the suprarenal capsules, however, as in many instances of Addison's disease, there seems no intrinsic reason why there should not be primary chronic tuberculosis of the spleen, and whether Giffin's views are confirmed by further researches or not, it seems well worth while investigating the spleen after splenectomy for obscure anæmias with splenomegaly, to ascertain how many, if any, exhibit evidence of the trouble being due to primary tuberculosis of this organ.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1920, May, 355.

TUBERCULOUS ABSCESS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

The writer has for many years treated cold abscesses, large and small, by the following method, and from a time-saving point of view the results have been most satisfactory. An incision about 3 in. in length is made over the prominent or pointing portion of the abscess cavity, the pus and all débris

are evacuated, and wiped out by means of gauze held in long forceps. The cavity is packed for two or three minutes with a tampon of gauze until the oozing ceases. The interior is smeared, with the aid of gauze and forceps, with a paste of 2 parts iodoform, 1 part bismuth subnitrate, suspended in a solution of 1-1000 corrosive sublimate. B.I.P.P. is equally effective. The cavity is then filled with iodoform gauze, and the skin is tightly closed by a blanket suture and one or two deep interrupted sutures of silkworm gut. Before the wound is completely closed, an incision about half an inch long is made two or three inches away from the main wound, and a forceps is passed through it into the abscess cavity. The end of the gauze is pulled for a short distance through this small incision. After closure of the main wound the gauze is pushed back just below the skin level, and the small incision is then closed with a couple of Michel's clips. In forty-eight hours the small incision is opened and the gauze removed. Usually a large quantity of fluid stained with blood and containing iodoform and bismuth is extruded. The small incision is again closed by suture or Michel's clips. After this procedure there is no discharge from either wound for three or four days, and then usually some oozing from one or the other.

It has been found that most abscess cavities close after this treatment without further aspiration. By this method internal drainage is established for forty-eight hours, and the abscess cavity is emptied a second time by removal of the gauze.

A. K. Henry¹ has had good results from a somewhat similar procedure. He recommends the use of bismuth 1, iodoform 2, vaseline 12, hard paraffin q.s. to give the consistency of butter. He credits Mr. Atkinson Stoney with this preparation, and gives the excellent results obtained by that surgeon.

Durante² uses Hypertonic Salt Solution in the treatment of tuberculous abscesses. The abscess cavity should be emptied, cleaned out, and filled with salt solution every four days.

Fernandez³ states that Aspiration will frequently arrest the course of a tuberculous abscess and effect a complete cure. He quotes a number of cases, and adds that general treatment has been carried out under sanatorium conditions on conservative lines.

"In aspiration a stout needle with a good bore is essential; one also avoids inflamed areas and prefers an oblique puncture. An attempt should be made to arrest an abscess without modifying fluid. In some of the above cases simple aspiration has been found effective. A great many diluents have been advocated—trypsin, lactic acid, B.I.P.P., cinnamic acid, essential oils like garlic, cajaput. Personal experience of the nature of the abscess will be an asset in the choice. Saline, iodine, colloidal solutions have also been used. In certain types solution of ether, camphor, and thymol, first advocated by Menard, Koch, and Risacher, and followed by Gauvain, has been found effective.

"The conclusion reached from the above consecutive cases was that sinus formation frequently follows incision, whilst it is an exception in the aspiration method. The mortality and the time factor in the former also do not compare favourably. In pulmonary cases, avoiding anaesthesia is an additional advantage. With early diagnosis and efficient continued aspiration, tuberculous abscess is arrested sooner than by incision, and complications are prevented. In the *Lancet* of Dec. 21, 1912, Openshaw and Roth, in treatment of Pott's disease by conservative methods, preferred aspiration to incision. In certain cases they found arrest was secured by non-interference."

REFERENCES.—¹*Med. Press*, 1919, Nov., 382; ²*Lancet*, 1919, ii, 735; ³*Ibid.* 1193.

TYPHOID FEVER. (*See also* INFECTIOUS DISEASES PREVENTION; PARATYPHOID FEVER.) J. D. Rolleston, M.D.

ETIOLOGY.—In a central hospital for typhoid and dysentery carriers at Vienna, Schuman-Leclercq¹ states that it is the practice to examine the bile as well as the urine and faeces before deciding that a patient is free from infection. A breakfast consisting of a yolk of an egg, two biscuits, 25 grms. of butter, 0.5 grm. of Witte's peptone, and 200 c.c. of broth is given, and two hours later the bile is withdrawn by a duodenal sound. Of 45 cases examined, the stools and bile were both positive in 17, the stools were positive and the bile negative in 11, the stools negative and the bile positive in 4, and the stools, bile, and urine negative in 13.

Hirschbruch and Forthmann² report the case of a female laboratory assistant who was accidentally infected by sucking up a culture of typhoid bacilli in a pipette while performing a Widal's reaction. She had been inoculated against typhoid three years previously. Immediately after getting the culture in her mouth she washed it out with absolute alcohol, some of which she swallowed. The symptoms of typhoid developed thirteen days later. The writers refer to Kisskalt, who has collected 57 cases of laboratory infection, at least half of which were due to the use of the pipette. It was found that recent cultures often gave rise to mild attacks, whereas cultures which had been grown on artificial media for years, as in the present case, often caused a severe illness. Other modes of infection in laboratories are the accidental breaking of culture tubes and spilling them on the clothes with subsequent infection of the mouth, contamination of the outside of vessels containing specimens of stools, and soiling the fingers in handling plate cultures the cover of which is broken. When infection has taken place, the mouth should be washed out with a disinfectant solution, and a powder taken three times a day containing tannoform 1 grm. and calomel 0.3 grm. Preventive inoculation is of doubtful value for laboratory workers, as the protection conferred thereby lasts only a short time, and the inoculations would therefore have to be repeated very frequently. The use of typhoid vaccine is also of doubtful value after infection has actually taken place, as the disease usually develops in such cases after an incubation period of twelve days, whereas the vaccine does not confer immunity until twenty-one days.

E. H. Schorer³ states that bacteriological examination of the stools of a thousand returning overseas U.S. troops showed no typhoid or paratyphoid bacilli, the only pathogenic organisms being dysentery bacilli, of the Hiss-Russel-Y and Flexner types respectively, which were found in two individuals, so that only 0.2 per cent of all men examined were found to be carriers. Clinical cases of similar infections among returning troops were as follows: Of 50,747 men passing through the hospitals of the ports of embarkation during March, April, and May, 1919, 6 had typhoid fever, 1 had dysentery of the Hiss-Russel-Y type, and there were no cases of paratyphoid fever. It is thus obvious that the infections which had occurred in the American Expeditionary Force during the autumn and early winter of 1918 (*see* MEDICAL ANNUAL, 1920, p. 365) had remained limited and did not give rise to any after-math of carriers.

SYMPTOMS.—E. Mondolfo⁴ describes the following *atypical forms* of typhoid fever: (1) Anomalies in the onset of the disease, including sudden onset, early hæmorrhagic syndrome, and 'war typhoid'; (2) Anomalies consisting in the predominance of one symptom or group of symptoms in one organ or system, such as laryngo-typhoid, broncho-typhoid, pneumo-typhoid, pleuro-typhoid (*see* MEDICAL ANNUAL, 1920, p. 366), appendiculo-typhoid, early typhoid cholecystitis, nephro-typhoid, meningo-typhoid, and early typhoid psychoses;

(3) Anomalies in the temperature, such as rapid rise, inverted type, sudden defervescence, intermittent type; (4) Larval forms such as apyrexial and ambulatory typhoid. In cases with sudden onset the serum test is usually positive from the beginning of the disease, whereas in ordinary typhoid it is generally negative at this stage. The early hæmorrhagic syndrome is characterized by profuse epistaxis, hæmorrhage from the mouth, intestine, kidneys, lungs, uterus, and skin, accompanied by profound prostration. Mondolfo describes three varieties of pneumo-typhoid. In the first, pneumonia dominates the clinical picture at the onset; subsequently the characteristic symptoms of typhoid fever appear and the respiratory symptoms subside. In the second group the symptoms of pneumonia and typhoid co-exist from the onset. In the third the signs of pneumonia predominate, and typhoid symptoms are latent. In appendiculo-typhoid the disease commences with symptoms of appendicitis, and the ordinary manifestations of typhoid are absent. In such cases the symptoms in favour of typhoid are the indefinite localization of the pain in the right iliac fossa, the absence of rigidity of the abdominal wall, a comparatively slow pulse, headache, stupor, albuminuria, and enlargement of the spleen. The pain is more diffuse and less severe than in appendicitis. Lastly, leucopenia is in favour of typhoid, whereas leucocytosis indicates appendicitis. In apyrexial typhoid there is either no fever at all, or the fever has been absent during a certain time, or so slight as barely to reach a subfebrile level.

H. Heiman⁵ reports a case of typhoid fever transmitted to an infant eight months old through the mother's milk, in which typhoid bacilli were found. The attack was severe, but the issue of the case is not recorded. Heiman could not find any similar case in the literature. In Lawrence's case in which typhoid bacilli were found in the milk, the infant escaped infection.

Gioseff⁶ records four cases of *typhoid fever in old age* which were remarkable for the mildness of their course. A man, age 82, fell ill seventeen days after his daughter, with diffuse bronchitis, enlargement of the spleen, and a temperature of 100.4°. Widal's reaction was positive. Two patients, age 72 and 74 respectively, had similar attacks. A woman, age 80, fell ill with a subfebrile temperature, drowsiness, hypochondriasis, and dysuria. Widal's reaction was positive. All the cases recovered.

Under the name of the *lip phenomenon* E. Paulicek⁷ describes a peculiar bluish-red discoloration of the lips, which is chiefly found in mild and moderate attacks in which the diagnosis is difficult owing to the scarcity of symptoms, whereas in severe cases the sign is absent or not pronounced. It is not found in any of the diseases likely to be mistaken for typhoid fever, such as septicæmia, miliary tuberculosis, endocarditis, influenza, malaria, or typhus, but is not uncommon in tuberculous disease of the apex.

M. R. Reid and J. C. Montgomery⁸ have collected 18 cases of *typhoid cholecystitis* in children, 8 of whom died without operation in the period prior to 1893, and 10 of whom were treated surgically, with only one death. The importance of differentiating between gall-bladder complications which do, and those which do not, require operation, is emphasized. Slight pain and tenderness over the gall-bladder, with some spasticity of the rectus, is not uncommon in typhoid fever, and in the vast majority clears up without operation. In acute suppurative typhoidal cholecystitis immediate operation is indicated, preferably cholecystectomy.

A. L. Moreton⁹ records a case of *acute intussusception* in a woman, age 24, successfully treated by operation, and has collected ten other examples of this rare complication. It may occur at any time during typhoid fever, but is usually late in its course or during a relapse. It may be caused by irregular

peristalsis due to inflammatory changes in the intestinal wall, or by an enlarged Peyer's patch projecting into the lumen of the gut. The intussusception is usually of the enterocolic type. If of the enteric type, there may be more than one lesion. Most of the cases of intussusception in typhoid fever are diagnosed as perforation, from which it is distinguished by the onset not being so sudden, the colicky character of the pain, the freedom of abdominal movement, the presence of a swelling on abdominal or rectal examination, and by the absence of any diminution of the area of liver dullness or increase in the leucocyte count. The prognosis is good in cases submitted to laparotomy.

G. Laroche and G. Peju¹⁰ propose the following classification of *meningeal manifestations* in typhoid fever: (1) Meningeal syndromes with a clear fluid in which the cell and albumin content is little if at all affected, and the culture is negative. This form is always mild, and generally clears up rapidly without affecting the prognosis. It is most frequent at the onset of typhoid, but may also occur at the height of the disease or during its decline. As a rule it is of short duration, but sometimes lasts several days, and in exceptional cases several weeks. (2) Meningitis in which typhoid or paratyphoid bacilli are cultivated from the cerebrospinal fluid is much rarer. The fluid is clear or turbid, but rarely purulent. The prognosis is grave, death being observed in about half the cases. (3) Suppurative meningitis due to secondary infection with staphylococci, pneumococci, streptococci, etc., with or without typhoid or paratyphoid bacilli. This form of meningitis is always fatal.

E. A. Baumgartner and H. H. Olsen¹¹ have collected 23 cases of purulent typhoid meningitis, in patients from four months to fifty-five years old, which have been published since Cole's compilation in 1904. All of them yielded cultures of typhoid bacilli in the cerebrospinal fluid, in most instances before death, which occurred in every case. The autopsies showed a frequent lack of the usual typhoid lesions, although many of these cases gave positive Widal reactions and blood cultures.

A. Macchi¹² reports a fatal case of *Landry's paralysis* in a woman, age 31, in whom this complication developed on the twenty-eighth day of disease, death taking place two days later. Histological examination of the nervous system showed that the lesions consisted of a mild form of meningo-myelitis and degenerative changes in the peripheral nerves.

A. Nitzesco¹³ reports three cases of *typhoid associated with paratyphoid infection*. In the first case typhoid fever was immediately followed by paratyphoid A, which proved fatal, death being due to intense adynamia. At the autopsy numerous characteristic ulcers were found in the solitary follicles and Peyer's patches, and the paratyphoid A bacillus was isolated from the blood, spleen, and intestine. The other two cases were examples of typhoid fever associated with serofibrinous pleurisy due to the paratyphoid B bacillus. Nitzesco thinks that if all cases of typhoid fever with pleuropulmonary complications were examined bacteriologically, mixed infection would be found to be a more frequent occurrence.

G. Guillain, G. Laroche, and E. Libert¹⁴ report the case of a woman, age 19, in whom the clinical symptoms closely resembled those of acute poly-articular rheumatism, but a blood-culture revealed the existence of typhoid septicæmia. The writers conclude that a blood-culture is indispensable in febrile disorders, even when the diagnosis appears certain.

PROPHYLACTIC INOCULATION.—P. W. Bassett-Smith¹⁵ gives an account of the antityphoid and antiparatyphoid inoculations and cases of infection in the Navy from Oct. 1, 1918, to Sept. 30, 1919. Of 17,401 inoculated, 2273 were given one, and 15,128 two injections. During the year the total number

of cases was 48, consisting of 42 typhoid cases, 3 paratyphoid A, and 3 paratyphoid B. There were 5 deaths among the inoculated. Of the 8 typhoid cases who had been inoculated twice before they contracted the disease, a period of three years had elapsed in 2; in the other 6 the interval was between twelve and eighteen months. In the cases of paratyphoid A and B which had had two inoculations, the period in each was two years before the onset of the fever.

F. F. Russell¹⁸ states that the antityphoid vaccination carried out in the American Army during the war reduced the incidence of typhoid fever, not only below the rates for previous wars, but also below the rate found in civil life in some of the older states, where the entire population is protected by modern sanitary measures. Thus, the Army rate for 1908 was 0.03 per thousand for troops in the United States, and 0.08 per thousand in the American Expeditionary Force, as compared with a rate of 0.14 per thousand among young men of corresponding age at home under peace conditions. During the period of the participation of the United States in the War (April 6, 1917, to Nov. 11, 1918), approximately 4,000,000 men served in the United States Army, and during the full two years there was a total of 1065 cases of typhoid fever (or one among every 3756 men), with 156 deaths (or one death among 25,641 men). This is in striking contrast with what occurred in the Hispano-American War, during which there was one case for every seven men (141 per 1000) and one death among every 71 men (14 per 1000).

The eighth annual report on typhoid in the large cities of the United States¹⁷ shows an unusually large percentage of typhoid reduction as compared with previous years. This is partly explained by the immunization in the Army camps of a large proportion of a particularly susceptible age group, and partly by a continued safeguarding of water and milk supplies. The disease has thus been reduced to such an extent that health authorities are able to devote more attention to the prevention of contact and carrier cases.

TREATMENT.—W. R. Stokes and H. W. Maldeis¹⁸ review the recent literature on the specific treatment of typhoid fever, and record their personal observations of about 100 cases treated by Vaccine. With small doses, such as 10 million bacteria, no practical results were obtained; but with larger doses, beginning with 50 million, increased to 100 million and 250 million, the duration of the disease was shortened in a fair number of cases, and not a few showed a rapid fall of temperature to normal after several doses.

B. Stein¹⁹ treated 500 cases of typhoid fever with a polyvalent sensitized vaccine prepared according to Besredka's method. In 84 per cent the treatment had a favourable effect, in 10 per cent it had no action, and 6 per cent of the cases were fatal. In none of his cases treated by vaccine did intestinal perforation or hæmorrhage occur, whereas these complications were not uncommon in other cases at the time which did not have vaccine treatment. The injections were given subcutaneously or intramuscularly in doses of 0.5 to 1 c.c. (250 to 500 million bacilli). As a rule four injections were required, but sometimes one or two were sufficient.

A. Rodet and S. Bonnamour,²⁰ who had previously reported 127 cases treated exclusively by Rodet's Serum (see MEDICAL ANNUAL, 1920, p. 367), now relate the results of this treatment in 119 more cases, or a total of 246. The total mortality was 11 per cent, which was reduced to 8.4 per cent if only cases treated before the twelfth day were considered. The serum appeared to have a favourable action not only on the temperature but also on the toxic symptoms. Its value, however, was chiefly shown by its reducing the duration of the disease. It had no bad effects, and had no contra-indications.

Surgical Treatment of Carriers.—According to H. J. Nichols, J. S. Simmons, and C. O. Stimmel,²¹ who record the results of surgical treatment in six chronic typhoid carriers, so-called 'urinary' carriers are really kidney carriers, and can be cured by nephrectomy. An additional argument for operation is present if the infected kidney is functionless. They regard 'intestinal' carriers as bile-passages carriers who fall into one of two groups: (1) Cases in which the gall-bladder alone is infected: these can be cured by cholecystectomy. (2) Cases in which the gall-bladder and bile-passages are both infected: this condition is at present incurable. The writers conclude that surgical treatment of carriers, while not perfect, is the best available.

REFERENCES.—¹Wien. klin. Woch. 1919, 1074; ²Med. Science, 1920, ii, 4; ³Jour. Amer. Med. Assoc. 1919, ii, 763; ⁴Policlinico (Sez. Prat.), 1919, 1475; ⁵Jour. Amer. Med. Assoc. 1919, ii, 913; ⁶Med. Science, 1920, ii, 4; ⁷Wien. klin. Woch. 1919, 964; ⁸Johns Hop. Hosp. Bull. 1920, 7; ⁹Brit. Jour. Surg. 1920, April, 490; ¹⁰Bull. Soc. méd. Hôp. de Paris, 1920, 150; ¹¹Arch. Internal Med. 1920, i, 537; ¹²Osp. Maggiore, 1919, 13; ¹³Bull. Soc. méd. Hôp. de Bucarest, 1919, 92; ¹⁴Bull. Soc. méd. Hôp. de Paris, 1920, 534; ¹⁵Jour. R.N. Med. Service, 1920, 13; ¹⁶Jour. Amer. Med. Assoc. 1919, ii, 1863; ¹⁷Ibid. 1920, i, 672; ¹⁸Boston Med. and Surg. Jour. 1919, ii, 625; ¹⁹Wien. klin. Woch. 1919, 895; ²⁰Presse méd. 1920, 81; ²¹Jour. Amer. Med. Assoc. 1919, ii, 680.

TYPHUS FEVER.

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—In a study of the prevalence of typhus in Mesopotamia from October, 1917, to December, 1918, J. C. G. Ledingham¹ states that typhus, like relapsing fever, started in the last quarter of the year, and attained its maximum prevalence in April, thereafter falling abruptly to minimal or zero figures in the hot season. After April conditions became increasingly unfavourable for the louse, the very high temperature with rapidly diminishing humidity interfering with breeding, while the hot weather led to shedding of superfluous clothes and to excessive sweating, thus depriving the louse of comfortable shelter.

Legry, Courcoux, and J. Lermoyez,² who record a mild outbreak in a refuge for Polish workmen in Paris, state that during the war several outbreaks of typhus occurred in France, but were rapidly brought under control owing to an early diagnosis which enabled the necessary prophylactic measures to be taken. They point out that the first cases are often mild and end in recovery, while severe and fatal cases do not develop until the epidemic has become somewhat extensive.

SYMPTOMS.—G. Vittorugo³ found that in 23 out of 220 cases of typhus in a prisoners' camp deferescence took place by lysis instead of by crisis. All the cases showed the typical symptoms of the disease, and the Weil-Felix reaction was positive in all those in whom it was performed. In a very few instances, instead of the ordinary branny desquamation, the skin peeled off in large flakes as in scarlet fever.

According to A. Stroë⁴ *typhus fever in children* is generally a mild disease. The duration of the fever is usually from seven to twelve days, and only rarely fifteen days. It is not until the age of seven years that typhus assumes the characters of the disease in the adult in a mild form. The eruption is absent in about 25 per cent; in others it is very transient, and merely consists of a few lenticular spots which disappear in twenty-four to forty-eight hours. In some cases, however, especially in children over seven years of age, the eruption presents the same characters as in adults. Injection of the conjunctiva is a very constant sign in children. Signs of profound intoxication are extremely rare, and the dyspnoea is never so intense as in the adult.

C. Artom⁵ draws attention to the *tongue sign* described by Remlinger, which is due to a paresis of the tongue muscles and is present more or less distinctly in all patients. The anterior part of the tongue is most affected, so that when

the patient is told to put his tongue out, its tip remains fixed to the floor of the mouth, while the posterior portion is thrust forward, the tongue being, as it were, folded in two.

P. Bonnet and S. de Nabias⁶ found that *parotitis* was a frequent and severe complication during a typhus epidemic in Roumania in 1917. There was deafness and discharge from the ears, which was caused, not by otitis media, but by separation of the bone and cartilage of the external auditory meatus. The writers regard the *parotitis* as due to an ascending infection by Steno's duct, as they were able to prevent or minimize the complication by use of an iodized-water mouth-wash. The infection was of a mixed character, in which streptococci predominated. Three clinical forms of *parotitis* in typhus may be distinguished: (1) A simple inflammatory form; (2) A phlegmonous form, with general enlargement of the gland, little pus-formation, and frequently the occurrence of a residual abscess; (3) A necrosing or dissecting type. The writers recommend a posterior incision beginning at the mastoid and following the ramus of the jaw a finger-breadth behind it.

Legry, Courcoux, and Lermoyez² state that a *meningeal reaction*, as shown by nuchal rigidity, Kernig's sign, and excess of albumin and lymphocytes in the cerebrospinal fluid, has been almost constant in recent epidemics, although little is said about it in the text-books. According to R. Monteleone,⁷ the characteristic changes in the cerebrospinal fluid in typhus are hypertension, excess of albumin, pleocytosis, and the absence of Nonne's reaction. In three out of seven cases the Weil-Felix reaction was positive in the cerebrospinal fluid as well as in the blood.

V. Arnold⁸ found that *optic neuritis* was present in 144 out of 244 cases of typhus, or 59 per cent. It was a late symptom which often did not appear until the eruption had almost or entirely faded. In a large proportion of the cases the neuritis rapidly and completely subsided after the temperature had become normal, but in a few instances it was still present two or three months after the attack.

DIAGNOSIS.—According to J. C. G. Ledingham,¹ the Weil-Felix reaction (see MEDICAL ANNUAL, 1919, p. 457; 1920, p. 369) is given by the serum of 90 to 100 per cent of typhus patients at some stage of the disease. Reactions have been obtained with dilutions up to 1-30,000, while control sera either do not agglutinate the organism at all, or react with it, in a small proportion only, in dilutions not exceeding 1-50. About 50 per cent of cases give the reaction by the fifth day, and by the tenth day practically all cases react. Ledingham suggests that the Weil-Felix reaction belongs to the category of paragglutination phenomena, from which, however, it differs in one material point—the permanence of the agglutinability of *proteus* with typhus sera in spite of long-continued laboratory growth.

E. Friedberger and V. van der Reis⁹ found subcutaneous and intracutaneous injections of Weil-Felix bacilli in small doses almost always caused an intense inflammation of the skin in normal individuals and all diseases except typhus, in which the reaction did not appear at all or was ill-marked. In a number of cases it was possible by this skin reaction to make a diagnosis of typhus, which was subsequently confirmed by the clinical symptoms and the Weil-Felix reaction.

According to W. H. Willcox,¹⁰ an important diagnostic symptom in the acute stage of the disease is the loss of the knee-jerk, which usually disappears about the fifth day and remains lost during the febrile stage and for a varying period after this has subsided.

Legry, Courcoux, and Lermoyez² maintain that it is a grave mistake to wait for the eruption of petechiæ before making a diagnosis, and to exclude typhus

because the eruption persists in the form of pink macules. In mild cases, as Murchison has shown, a petechial eruption is exceptional.

TREATMENT.—W. H. Willcox¹⁰ found the administration of Normal Saline of great value. In severe cases this was given rectally every four hours, commencing about the eighth day, and in the later stages subcutaneous and intravenous salines were given. When symptoms of venous thrombosis threatened, intravenous injections of normal saline containing $\frac{1}{2}$ per cent and 1 per cent of Sodium Citrate were of value.

Good results have been obtained by E. Prado Tagle and F. Opazo¹¹ from the employment of Nolf's method of intravenous injection of Peptone. Ten c.c. were given as a first dose to robust adults, and 4 to 5 c.c. to older children, and after forty-eight hours' interval a second dose, about half the size of the initial one. In exceptional cases a third dose of 1 or 2 c.c. was given.

The only drug employed by E. Schweinburg¹² was Camphor Oil (10 to 20 per cent solution), a teaspoonful being given every two or three hours, according to the condition of the pulse. Not only was the camphor beneficial to the heart, but the admixture of the oil stimulated the sluggish intestinal functions and relieved the dryness of the mouth and throat.

REFERENCES.—¹*Lancet*, 1920, i, 379; ²*Presse méd.* 1920, 195; ³*Policlínico* (Sez. Prat.), 1919, 1067; ⁴*Brit. Jour. Child. Dis.* 1920, 24; ⁵*Policlínico* (Sez. Prat.), 1919, 985; ⁶*Lyon chir.* 1919, 172; ⁷*Policlínico* (Sez. Prat.), 1919, 1009; ⁸*Wien. klin. Woch.* 1919, 893; ⁹*Munch. med. Woch.* 1919, 1075; ¹⁰*Lancet*, 1920, i, 320; ¹¹*Jour. Amer. Med. Assoc.* 1919, ii, 1400; ¹²*Wien. klin. Woch.* 1920, 129.

ULCER OF LEG. (See also SKIN, GENERAL THERAPEUTICS OF; VASCULAR SURGERY.)

E. Graham Little, M.D., F.R.C.P.

Schlasberg¹ recommends the following treatment. The ulcer is cleansed by soaking in Burow's Solution (alum 1, lead acetate 5, water 100) for three days. Then a Plaster is applied consisting of liquor plumbi subacetatis 24 grms., lead plaster 136 grms., spread on a piece of cloth of 2000 sq. cm. The plaster should extend 2 cm. beyond the edge of the ulcer. The leg is bandaged from ankle to knee. The bandage is removed each day, and if there is much discharge the plaster is renewed; if not, it may be left in place, but not for longer than three days. Healing frequently takes place within two weeks.

Stearns² recommends a method of using Unna's Paste which he describes as follows: The ulcer is first cauterized with fused silver nitrate, and the leg elevated for twenty-four hours to clear the œdema. Then a dressing, after the formula of Unna, is applied: gelatin 2 parts, zinc oxide 1 part, glycerin 3 parts, water from 4 to 6 parts (depending on the consistency desired). These are mixed in a water-bath, and the paste is applied warm with a spatula to the entire leg from the ball of the foot to the knee, leaving the heel free. A roller bandage is immediately applied over this so that the paste penetrates the first layers of the bandage; if applied smoothly and evenly this makes an ideal supporting bandage and prevents a return of the œdema when the patient is again ambulant. Forty-eight hours after cauterization, a small window is cut in the dressing over the ulcer. The slough is cleaned away with a sharp curette until the surface is clear, clean, and easily bleeding. The edge of the undermined ulcer is then cut away, and this tissue is introduced into the crater of the ulceration, covered over with a small sheet of perforated rubber and a sterile dressing, and the limb kept raised for three days, when the wound is dressed and the rubber removed. The paste covering may be retained for two weeks, and then reapplied if required.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* (abstr.) 1920, Feb. 7, 432; ²*Ibid.* Jan. 17, 172.

ULCERS.

In ophthalmic work, treatment by *Tincture of Iodine* discussed (p. 13).

UNCINARIASIS. Oil of *Chenopodium* found more satisfactory than thymol in treatment (p. 7). (See also *ANKYLOSTOMIASIS*.)

URETER, SURGERY OF. (See also *KIDNEY, SURGERY OF*.)

J. W. Thomson Walker, M.B., F.R.C.S.

Ligature of the Ureter.—Caulk and Fisher¹ give the result of an experimental study of ureteral ligature, and describe the changes which take place in the ureter and kidney in such cases. Many cases have been described where one or both ureters have been ligatured during pelvic operations. The authors experimented on dogs, 70 in all being used, and endeavoured to solve certain clinical problems. They found that where the ureter was tied with No. 2 plain catgut, the catgut was never absorbed before the end of three weeks, by which time the patient would have died of uræmia had both ureters been tied, or the one kidney would have been destroyed had the ligature been unilateral. One of three operations should be undertaken, namely de-ligature, uretero-vesical anastomosis, or nephrostomy. The ideal method would be immediate de-ligature, but the operation following soon after a pelvic operation would be difficult and dangerous, and there would be a risk of producing a fistula by incising or injuring the ureter. Uretero-ureteral anastomosis is not satisfactory, as it is frequently followed by fistula and stricture. Nephrostomy is the best procedure, and will probably be followed by opening of the lumen of the ureter after some weeks. In double ligature, nephrostomy should be done promptly in order to save the life of the patient. After single ligature the question of interference is more difficult, but the authors conclude that, where the condition is known to have occurred, nephrostomy should here also be performed without delay.

An interesting point was observed, namely, that the nitrogen content of the blood after a single ligature showed a gradual rise until the time the kidney was drained. Following this there was a sudden rise in some instances, but usually a very slight one. Then within two to four days after drainage the blood nitrogen drops to normal, and remains so if the drainage is sufficient.

Wislocki and O'Connor² report experimental observations upon the ureters with especial reference to peristalsis and antiperistalsis. They found that after partial ligature of the ureter its lumen increases in diameter and its musculature hypertrophies. When examined several weeks after operation, spontaneous peristalsis and, frequently, antiperistalsis are observed. The peristaltic waves are always more vigorous and occasionally more frequent than those seen in the normal ureter. The ureter below the partial ligature exhibits normal spontaneous peristalsis. When the ureter is completely ligated, the lumen is larger and the musculature is hypertrophied. The completely ligated ureter seldom shows any spontaneous peristaltic movements, nor does it usually react to stimuli. When, however, part of the contained fluid is released, violent peristaltic and antiperistaltic movements commence, and are similar to those of the partly ligated ureter.

Small beads pass down the ureter by a series of peristaltic waves. The peristaltic waves are not interrupted by the bead in its passage; but, if the bead is so large as to become impacted, vigorous peristaltic waves come down the hypertrophied ureter from the renal pelvis, but invariably stop at the bead. Below the bead other peristaltic waves originate and proceed towards the bladder.

When a moderate retention is produced in a rabbit's bladder possessing a

good muscle tone, the ureterovesical sphincter is occasionally prevented from closing as it normally does after each gush of urine from the ureter, and the intravesical pressure projects a column of fluid into the ureter. In an animal with quiescent ureters this reflex is difficult to produce. Antiperistaltic waves preceding the ascending fluid column were not observed.

The authors are sceptical in regard to the conveyance of organisms up the ureter and the production of retrograde movements of ureteral calculi by antiperistaltic contractions.

Smith³ reports two cases of bilateral ligature of the ureter. One was a woman of 40 years who had a supravaginal hysterectomy. Seventy-two hours after the operation there was suppression of urine, vomiting, and lumbar pain. Ureteral catheters passed 8 cm. Both kidneys were exposed, and the pelvis was found distended but not dilated. Drainage tubes were introduced through the kidney substance. A month after the hysterectomy the ureters were exposed, and the point of ligature was found buried in inflammatory tissue. The ureters at this point were thinned down to a fibrous cord. On the right side a very fine lumen existed, and a longitudinal incision was made and the walls were united transversely. On the left side the portion of ureter was resected and an end-to-end anastomosis carried out. A catheter was left in the left ureter for six days. The operation was successful.

In a second case hysterectomy for carcinoma had been performed, and bilateral nephrostomy was done twenty-four hours later. Three months after the operation the ureters were transplanted into the upper portion of the bladder. The right nephrostomy wound healed, but the left persisted, and recurrence of the carcinoma prevented further operation.

Calculus.—Ochsner⁴ makes the following observations on renal and ureteral stones. The size of the pelvic stone will usually determine the possibility of its passing spontaneously. In the ureter the primary stone, if it gets started, will usually pass. Secondary stones may be stopped by cicatricial contraction which may have been caused by the passage of previous stones. A large proportion of stones of moderate size will pass spontaneously, or after dilatation of the ureter with bougies or the use of oil or glycerin injections. The taking of large quantities of distilled water appears to be effective in preventing recurrence.

In a discussion on the treatment of calculi impacted in the pelvic portion of the ureter, Kidd⁵ advocated waiting for at least one or two years provided there was no imperative indication for operative interference, such as bacterial infection, anuria, or if the stones were bilateral. Operative interference was advisable if the stones were too large to pass. The methods of treatment of ureteric stones, short of operation, are the administration of **Diuretic Waters**, the injection of **Paraleine** through a ureteric catheter, the injection of 5 c.c. of 4 per cent solution of **Papaverine Sulphate** into the ureter (Geraghty and Walther), slitting of the ureteric orifice through the operating cystoscope or by fulguration, or the passage of a ureteric catheter with small dilatable bag to dilate the ureter. For open operation the author recommends a small muscle-splitting operation. Joly preferred the median incision and extraperitoneal removal of the calculus. The guides to the ureter were (1) the bifurcation of the common iliac artery, (2) the spine of the ischium, (3) the vas deferens. The size of the stone and presence of sepsis were the chief determining factors in regard to operation. Grey Turner found it necessary in some cases to open the peritoneal cavity in order to locate the stone. Rowlands had met with fifteen cases of ureteric calculi in ten years when the radiographer had failed to demonstrate a shadow. He had found the intramuscular injection of indigo-carmin, with the consequent staining of

the ureteric efflux, an important aid to diagnosis. For the removal of ureteric calculi he used a long paramedian valvular extraperitoneal incision, displacing the rectus and peritoneum inwards. H. Ballance disliked small incisions, and did not approve of opening the peritoneum. He used a lateral incision parallel to the iliac crest. C. Mayo said that in his experience open operation was just as safe as the method by operative cystoscopy. If the patient had a history of passing many stones, the waiting plan might be adopted; otherwise operation should be performed.

Kelly⁶ describes the removal of a stone weighing 11 grms., composed of calcium oxalate and uric acid, which was projecting from the lower end of the ureter. The stone was removed through the open tube, the patient being in the knee-chest position. After incising the ureteric orifice, the stone was broken up by means of a rat-tooth forceps, and the débris removed by filling the bladder with fluid and getting the patient to change position so that the fluid swept out the fragments.

Braasch⁷ discusses the conditions contra-indicating operation on stone in the kidney and ureter. Probably 75 per cent of renal stones were passed spontaneously. It is usually inadvisable to operate for stone in either the kidney or ureter until at least three to six months have elapsed before the onset of symptoms: exceptions are excessive and continued pain, evidence of cortical and perinephritic infection, and continued urinary retention; also if the stone is evidently too large to pass. Conditions permitting the formation of multiple stones are usually surgical. Conditions may be such that operation with bilateral renal lithiasis is definitely contra-indicated. Clinical evidence of a low renal function will usually contra-indicate operation when the symptoms are not very acute or persistent. The operation may be justifiable with acute symptoms, even though the renal function is far below the normal. The removal of stone in the presence of chronic nephritis does not affect the cause of the primary nephritis, and, unless surgical conditions are urgent operation is inadvisable. Stones occurring in bilateral pyelonephritis should be removed. When the opposite kidney is practically functionless or absent, operation on a single kidney or ureter is frequently done with success. Attempts to dislodge stones in the ureter should not be made in the presence of acute impaction with continued obstruction, acute renal infection, intolerance on the part of the patient to the cystoscope, anatomical deformity, and when the stone is more than 2 cm. in diameter.

Ureteral Anastomosis.—Peterson⁸ describes a case of uretero-ureteral anastomosis and discusses the literature. In removing the uterus he cut the right ureter when tying the ureteric artery, and at once did an end-to-end ureteral anastomosis. The bladder end was split for a quarter of an inch. The kidney end was transfixed by a fine cambric needle with fine linen thread. The ends to this were threaded in a needle and passed through the lumen of the bladder and through the wall of the duct one-third of an inch below the angle of the slit. The proximal end of the ureter was drawn one-third of an inch into the distal end by means of the traction suture. At the point of junction of the upper and lower portions the walls were united by fine silk sutures which did not penetrate the mucosa. The slit portion of the distal end was then united with these fine silk sutures. The traction suture was removed. The peritoneum was repaired and a gauze drain placed in the vagina. Seven months later the patient was examined. There was no stricture of the ureter, but a slight degree of dilatation of the renal pelvis and calices was found.

The author concludes, from the study of the literature, that ureteral anastomosis by the end-to-end, end-in-end, and end-in-side methods is a possible

procedure. The duct can be made patent with little or no stricture, and a functioning kidney and ureter can result. Leakage after uretero-ureteral anastomosis in the majority of cases means failure, since it leads to stricture, hydrometra, and hydronephrosis. The invagination method is preferable to the transverse end-to-end method, since it is followed by fewer cases of leakage. Alksul stated after an experimental study that every uretero-ureteral anastomosis is followed by a slight degree of hydrometra and hydronephrosis.

Dilatation of Vesical End of Ureter.—Kreisel and Gehl⁹ report a case of this description, and discuss the condition. Stenosis of the ureteral orifice, either congenital or acquired, is considered by the author as the most common cause. The symptoms are difficult and frequent micturition, terminal tenesmus; back-pressure with dilatation of the ureter and pelvis follow. The author distinguishes between cystic dilatation of the lower end of the ureter and prolapse of the ureteral mucosa. The blood-vessels run to the base of the prolapse, while they arise from the bladder mucosa in a cyst. In prolapse there is a pedunculated base and a broader top which contains the ureteric orifice, while a ureterocele has a broad base with the ureteral orifice excentrically placed. A prolapse may be replaced with a ureteric catheter. Following the emission of urine the ureterocele usually becomes collapsed, but remains unchanged if the orifice is completely obstructed by cedema, pus, or stone. In a very small or early ureterocele, cutting or cauterizing through the cystoscope may be tried, but in well-formed cysts of long duration operation is the method of choice.

Stricture of the Ureter.—Hunner¹⁰ states that in the past three and a half years he has treated about 500 cases of ureteral stricture. Ureteral stricture, he believes, is the cause of more pathological conditions (non-medical) than any other single factor. It accounts for the majority of cases of hydronephrosis and pyelitis, many cases of pyonephrosis, and many, if not the majority, of cases of hæmaturia. As a rule, the ureteral stricture and chronic ureteritis are due to focal infections. Most of the stones and strictures in women are found in the region of the broad ligament. The perimetritis associated with stricture, often due to focal infection of the lymphatics, may at times be so masked as to be mistaken for stone. The author uses a wax-tipped catheter for diagnosis.

Papilloma of the Ureter.—Marion¹¹ treated papilloma of the ureter by fulguration in two cases. Papillomata were present in the bladder, and hæmaturia continued after these had been destroyed. The catheter was arrested at 5 cm. by the ureteric papilloma. In one case nephrectomy was necessary later for papillomata of the renal pelvis.

Benzyl Benzoate found useful in ureteral colic (p. 6).

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1920, April, 313; ²*Johns Hop. Hosp. Rep.* 1920, June, 19; ³*Boston Med. and Surg. Jour.* 1920, June 13, 584; ⁴*Jour. Amer. Med. Assoc.* 1919, Oct. 11; ⁵*Brit. Med. Jour.* 1920, ii, 161; ⁶*Therap. Gazette*, 1920, May 15, 305; ⁷*Jour. Amer. Med. Assoc.* 1920, Jan. 24, 278; ⁸*Surg. Gynecol. and Obst.* 1920, Aug., 132; ⁹*Ibid.* Sept., 234 (abstr.); ¹⁰*Ibid.* Jan., 62 (abstr.); ¹¹*Jour. d'Urol.* Paris, 1919, Sept., 8.

URETHRA, DISEASES OF.

J. W. Thomson Walker, M.B., F.R.C.S.

Urethritis.—Barker¹ describes irritative urethritis caused by the use of prophylactic injections which had been prescribed by an apothecary in France. It was impossible to determine the content of all these solutions, but potassium permanganate, mercuric chloride, zinc sulphate, and silver nitrate were all identified. Twenty-four to forty-eight hours after the use of the prophylactic there were slight pain and burning and discharge, at first clear and then glairy, creamy, and purulent. Microscopically the discharge showed many epithelial

cells, and an increasing number of pus-cells, with a preponderance of the mononuclear types. The duration of the discharge was from two to eleven days, and recurrence might take place. No organisms were present in smears in 60 per cent of the cases, and no growth appeared on cultures in 50 per cent. There was a large Gram-positive diplococcus in 28 per cent. One case showed a mixed infection of *B. coli* and *Staphylococcus albus*, one a short streptococcus together with the Gram-positive diplococcus, and one had a very mixed bacteriology.

Diverticula.—Bumpus² describes four cases of diverticula of the posterior urethra, and reviews the literature. Watts classified them into congenital and acquired, and the latter were due to dilatation of the urethra due to calculus or stricture or to perforation of the urethra resulting from injuries, rupture of abscesses, or rupture of cysts. A true diverticulum was a dilatation of the prostatic urethra, with a mucous-membrane lining; a false diverticulum resulted from a rupture, and had a lining of epithelium or of fibrous tissue according to the repair that had occurred. Of the true diverticula the congenital are the most perfect. They occur in the anterior urethra. Diverticula of the posterior urethra are always of the acquired type, and usually traumatic in origin, most frequently after surgical measures. In many cases there is a swelling in the line of the urethra from which urine can be expressed, but in many cases there are no physical signs. They give rise to the following symptoms: (1) Dribbling or complete incontinence of urine; (2) Dysuria; (3) Feeling of discomfort and burning; (4) Frequent micturition. The condition may be overlooked, as it is often associated with a normal bladder.

Stricture.—Roberts³ considers that in India the type of stricture with which the surgeon has to deal is more extensive and difficult to treat than that seen in Europe or America. Intermittent dilatation is unsuitable for these cases and could not be carried out, as it may be impossible to pass an instrument through the stricture. Roberts advocates cutting down on a staff in the urethra in front of the stricture and feeling for the stricture lumen with a fine lachrymal probe. It is no help, he states, to hold the edges of the cut urethra apart with sutures, or to try and see the opening of the stricture. The roof of the urethra is the best guide. Having passed the fine probe through the stricture, the latter is incised with a tenotomy knife in three directions. A catheter is passed and the bladder emptied, but it is not necessary to leave the catheter in. The wound is allowed to granulate. The author considers Wheelhouse's operation disappointing, and states that the passage of a gorget through a stricture, "means tearing and traumatism in every direction". [The operation here outlined is, in fact, Wheelhouse's operation as it is usually described, except that the author feels instead of looking and feeling for the lumen of the stricture. The gorget is not an essential part of Wheelhouse's operation. Strictures occur in which the operator fails to find the lumen, and in such cases a dissection down to the dilated urethra behind the stricture will enable a bougie to be passed from behind forwards. The question must always arise in such cases if it is not better to excise the stricture and all scar tissue and repair the urethra by a plastic operation, draining the bladder by a tube above the pubes.—J. W. T. W.]

Stern⁴ describes an operation for stricture which consists in exposing the bulb by a perineal incision, detaching it "from the triangular ligament and from the urethra itself", incising the urethra longitudinally at the site of the stricture by cutting away the edges of the incision, and finally stitching the wound transversely. A catheter is left in the urethra for forty-eight hours, and then replaced by another for twenty-four hours. On the fourth day a catheter is passed every four hours, and on the fifth day voluntary micturition

is permitted. A sound is passed on the tenth day, and a larger one a week later. No further instrumentation is necessary.

Schmidt⁵ discusses mobilization of the urethra, after the excision of a stricture, in order to approximate the two cut ends of the urethra. Berk was the first to show that this could be done. In a case where Schmidt excised a stricture of considerable length, the ends of the urethra, which were 12 cm. apart, would not meet, even after mobilizing the urethra for 6 cm. forwards. An incision was made round the base of the penis, the suspensory ligament cut, and two further incisions were made at the base of the penis. The scrotum was split, and the penis displaced backwards so that the two ends of the urethra met without tension. Eight months after the operation the urethra showed no signs of recontraction.

Budde⁶ describes an operation for repairing a urethral defect. The ends of the urethra and the tissue between are prepared. An oblong portion of the skin of the scrotum in the median line is raised and left attached by a 'mesentery' of vessels and tissue. This is wrapped round a catheter and is passed backwards beneath the skin to the perineum. The ends of this epithelial tube are sutured to the ends of the urethra. The scrotal wound is closed and the perineal wound partly brought together. A catheter may be introduced if thought necessary, or a temporary suprapubic drainage installed.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, Nov. 29, 1691; ²*Surg. Gynecol. and Obst.* 1919, Oct., 388; ³*Ind. Med. Gaz.* 1920, Jan., 1; ⁴*Jour. Amer. Med. Assoc.* 1920, Jan. 10, 85; ⁵*Deut. Zeits. f. Chir.* 1920, May, 271; ⁶*Centralbl. f. Chir.* 1920, Jan., 32.

URINARY DISORDERS IN CHILDREN. (See CHILDREN, DISORDERS OF THE URINARY SYSTEM IN.)

URINE, CLINICAL PATHOLOGY OF.

O. C. Gruner, M.D.

A.—THEORETICAL.

The testing of urine only for a few simple substances, according to the usual routine, should, no doubt, become a habit of the past. The extended applications of complicated methods to be found in current literature would be found of more than research interest in hospital practice were the real purpose of the tests thoroughly appreciated. When summed up, the present scope of urinary examination amounts to the reaching of a decision as to whether there is disease in the urinary tract, and, if so, in which part. But this branch of clinical pathology should follow the same ideal as is to be sought for in the study of the blood—namely, it seeks to ascertain: (1) The efficiency of the kidneys; (2) The efficiency of the rest of the body in regard to (a) the organs in nearest relationship, (b) the organs in less obvious relationship, (c) the general metabolism. The detection of special diseases by its means is subsidiary, though naturally the most attractive. The attempt to perform this feat implies a misconception as to the true significance of the facts elucidated. All the methods of study which are to be found in the literature are directed to (1) or (2), though the application to such a scheme may not be clear. During very recent years, for instance, certain 'thresholds' are determined; each abnormal constituent and many of the normal constituents are considered to pass into the urine as soon as their concentration in the blood reaches a certain point. This term and this method of study are based on the view that renal excretion is entirely mechanical, as is borne out by the experiments of Marshall and Kolls.¹ These workers find that everything is explained, as far as the nervous mechanism of excretion is concerned, by an action on the blood-vessels; that is, by the rate of blood-flow. It will be seen, by those familiar with Sajous' views,² that this conclusion is identical with his; and turning

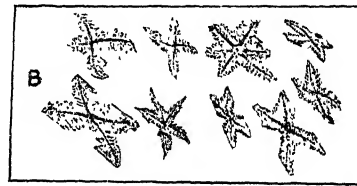
PLATE XL.

ALKALINE PHOSPHATE CRYSTALS IN URINE



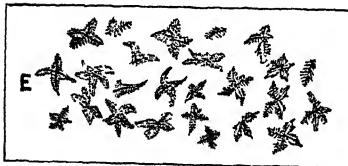
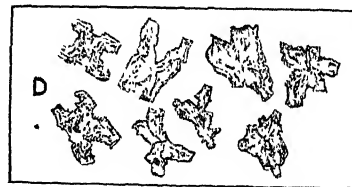
A. Normal crystals.

B. Light crystals, which sink very slowly. This type occurs in neurasthenia.



C. Smaller crystals and in simpler forms.

D. Crystals associated with cases of nerve degeneration.



E. Crystals found in nerve-cell degeneration.

Redrawn after 'New York Medical Record'

back nearly sixty years, it is a view constantly insisted on by the late L. S. Beale. Instead of nerves ending in renal cells, they end in relation to the capillaries. The substances in the blood are the cause of the various effects produced on the renal epithelium.³

The various forms of urinary examination entail more definite conceptions about the source of the substances tested for. In respect of many of these there is great variance of opinion. The relation between acidosis and creatinuria,⁴ the relation between acetone and indican,⁵ the meaning of urobilin,⁶ and of glycuronic acid,⁷ are good instances.

A number of papers on "The Phases of Kidney Secretions" by Martin Fisher and McLaughlin⁸ are of considerable interest, but do not lend themselves to a satisfactory précis—the general reader would wish for a preliminary orientation, the specialist will seek the full work. The subject is considered from the colloid chemical point of view.

B.—PRACTICAL.

1. Tests directed to some Special Object.

a. THE DETECTION OF THE FUNCTIONAL EFFICIENCY OF THE KIDNEY.

i. *From the urine alone.*—MacLean and de Wesselow⁹ have studied 10,000 newly-joined recruits and 50,000 apparently fit soldiers who had just completed their training. They conclude that the use of a large dose of urea is the best test. If the kidney is diseased, it cannot excrete a urine of high urea concentration. Venza¹⁰ uses 20 grms. urea for the test, and ascertains the highest concentration in which the urea can be eliminated, using the total urine for three or four days. He finds the amount to be peculiar to the individual and constant in him. This test will make the Ambard coefficient superfluous. (See BLOOD, CHEMISTRY OF.)

Scheel¹¹ uses a special test-meal ritual: bed for two or more days; fever diet, nothing to drink in the evening; a specified bread, egg, and fruit diet on the day of the test, and, as a test, one litre of weak tea. The rate of outflow of water, chlorides, and nitrogen, and the specific gravity, are noted. With nephritis the maximum water-outflow is later than the three-hours' limit of health. A specific gravity below 1020 after the test shows that the kidneys are at fault.

ii. *From the blood alone* (see BLOOD, CHEMISTRY OF).

iii. *From both urine and blood.*

iv. *From examination of the heart* (Polak¹²).—Certain exercises are gone through, the systolic and diastolic pressures are taken, and the pulse-pressure is noted; the phenolphthalein urine test is also applied. The tests are a simple means of deciding whether operation may be proceeded with.

v. See BLOOD, OXYDETIC POWER OF, p. 74; BLOOD, CHEMISTRY OF; and RENO-INTESTINAL BALANCE, p. 74).

b. THE DETECTION OF THE FUNCTIONAL EFFICIENCY OF OTHER ORGANS.—Dowd¹³ has analyzed the phosphatic excretion very minutely. He compares the urinary phosphates for the nervous system with the urea for the muscular system, and shows a number of distinctive features which enable one to assess the metabolic state of the nervous system. Earthy phosphates appear as microscopic sawdust in diseases of bone, and after a vegetable diet. The urine is filtered to remove these, and treated with ammonio-magnesium mixture. Alkaline phosphates are precipitated, and the form of the crystal is noted (Plate XL). Marked diminution means defective functioning of the nervous system; the size, shape, and density of the crystals show the amount of nutrition in reserve, how it is being used, and any changes that the nerve cells may be undergoing.

2. Tests for Individual Substances.

Albumin.—Bieler¹⁴ states that if a dilute Fehling is boiled as for the ordinary test for glucose, and one drop of filtered urine is added, a deep purple colour is produced. This reaction, due to an unknown protein, means severe general intoxication and great renal protein digestion. Bousfield¹⁵ has devised a flat copper steam-bath which enables the upper layers of a large number of separate urines to be boiled at once. This is a great help where large numbers of urines have to be tested daily. Dupuy¹⁶ gives a very rapid simple quantitative test. Two like tubes are used. To the first 4 c.c. of urine containing exactly 0.10 grm. albumin per litre is placed. A given quantity of Esbach reagent is added. This is a permanent standard. The other tube is graduated: 2 cm. of urine are used, and 2 cm. Esbach. If the turbidity is less than the first, the amount of albumin is negligible. If the turbidity is greater, the fluid is diluted to equality, using a semi-diluted Esbach. If more than $\frac{1}{2}$ grm. per litre, the urine must be diluted to a known degree before carrying out the test. Bauzil¹⁷ gives another rapid method based on the use of trichloroacetic acid and a drop measurement of the diluting fluid. A formula is necessary to calculate the value.

Glucose.—Sabatin¹⁸ has a drop method of estimation. One c.c. Fehling is dropped into a small dish, the number of drops being counted. A like number of drops of 10 per cent potassium ferrocyanide, and four times as many drops of water, are added. Gently warm. Then add urine drop by drop till the fluid is black. Amount of glucose per litre equals five times the number of drops in the 1 c.c. Fehling, divided by the number of drops of urine added.

Acetone Bodies.—Acetonuria occurs in children with measles, tuberculous meningitis, cervical adenitis, and jaundice.¹⁹ It also occurs in pregnancy (Cole²⁰). E. R. Wilson²¹ has found a relation between acetonuria and indicanuria, which he attributes to a gastro-intestinal bacterial process, especially where the kidney function is impaired.

Organic Acids.—Van Slyke and Palmer²² dispense with the estimation of acetone bodies by using a simple titration test. This is based on the fact that, in the presence of the salt of a weak acid such as an organic acid, a larger amount of a strong acid (HCl) is needed to produce a given change in the reaction of the fluid. By performing the titration always between the same limits, suitably chosen, the titration figure will measure the weak acids only. Carbonic and phosphoric acids must be removed from the urine by means of calcium hydroxide (2 grms. to 100 c.c. urine; filter in 15 min.). To 25 c.c. add $\frac{1}{2}$ c.c. of 1 per cent phenolphthalein and 0.2 normal HCl till the pink just disappears. Then add 5 c.c. of 0.02 per cent tropæolin-00, shaking thoroughly the while. Add the HCl solution again till the red colour equals a standard solution (0.6 c.c. of the same HCl solution, 5 c.c. tropæolin, and water to 60 c.c.). In health, 8.2 c.c. of decinormal acid are needed for every kilo weight per twenty-four hours.

Short²³ discusses the meaning of the presence of acetone in the urine after ether anaesthesia. It is not due merely to a diminished alkaline reserve after anaesthesia.

Ammonia-Nitrogen.—Piersol²⁴ considers this a true guide to the detection of acidosis. The amount present should be compared with the total urinary nitrogen. An increase in the relative amount of the first to the second strongly indicates acidosis. Normally, ammonia in the urine varies from five-tenths to one gramme, the ratio being almost constant at 1-25 (4 per cent). Lauritzen⁴ has studied this relation in diabetes, and compared the values with the creatin excretion. The latter runs parallel with the ammonia.

Urobilin.—Labbé and Carrié²⁵ deal with the origin of this substance, and its

significance. The statement that the amount of urobilin in the urine is an index of the functional capacity of the liver has been questioned, among others by Brulé and Garban (*see* FÆCES, EXAMINATION OF, p. 202), who showed that stercobilin and urobilinuria are not parallel. The present authors, reviewing the subject, conclude that the hepatic theory must hold the sway, granting that some urobilin may have other sources—a purely hæmal or a histigenic source. Brulé²⁶ points out that urobilinuria may mean a lesion in the liver itself, or in the biliary passages, or in the blood. It is a sign of pigmentary retention of a degree short of that in virtue of which bilirubin appears in the urine. Hence it is not correct to regard a case of urobilinuria as one of liver disease.

Chlorides.—Marcialis²⁷ finds that when chloride retention occurs in acute fevers, it means renal inadequacy. He considers that it helps to lessen the toxicity of the substances responsible for the fever.

Sgambati²⁸ describes a chromogen reaction in the urine in cases of acute peritonitis. A ring test with fuming nitric acid gives a dusky blue-grey colour, soluble in chloroform.

3. Physical Examination.—A new urinometer is described by Rosenbloom²⁹. It requires no separate jar, no pouring of the urine back and forth, and can be

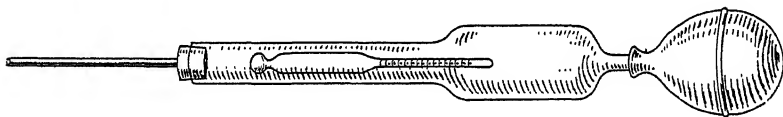


Fig. 58 —Rosenbloom's urinometer.

used when only small amounts of urine are available. The accompanying figure (Fig. 58) explains itself.

Molinari³⁰ finds that the hemolysis coefficient of urine enables one to detect renal disease and cancer. The amount of distilled water that has to be added to the non-hæmolytic urine before hæmolysis is induced is an index of the content in antihæmolytic substance. Healthy urine has to be diluted with 5 parts of distilled water to one of the urine before hæmolysis occurs. The ratio is thus 5-6. In nephritis and cancer the ratio is as low as 1-11, 1-6, 1-3. The urine is distributed in eight test-tubes, commencing with 6 c.c. and reducing by $\frac{1}{2}$ c.c. in each. The first tube is a control. To the others the volume is made up to 6 c.c. with distilled water. A drop of blood from the person from whom the urine is derived is added to each tube. The control is supplied with drops from another person.

Bechhold and Reiner³¹ apply the stalagmometer to the study of the urine. They find that in certain pathological urines substances called stalagmones depress the surface tension of the urine. They belong to the colloids or semi-colloids. Their dispersion is finer than that of proteins. They include albumoses and peptones and oxyproteic acids. Albumins and bile-constituents are included in certain kinds of disease. A stalagmometric quotient may be formulated, since this has clinical value, especially when combined with a measurement of the sedimentation-rate of the red blood-cells (Plaut's method³²).

4. Cytological Examination.—A review of simple methods of urine examination³³ advocates the use of a normal saline solution of methylene blue or neutral red when examining urinary deposits. The stain and the urine are lightly mixed, covered, and observed with a $\frac{1}{6}$ power. The same article reminds readers of commonly neglected precautions against simple fallacies.

5. **Bacteriological Examination.**—Herrold and Culver³⁴ have studied sixty-five strains of Gram-negative bacilli isolated from renal infections. There are two groups, the paracolon and the true colon. The latter vary markedly, and include *B. acidilactici* and *B. aerogenes*. There was no clinical similarity between infections by any one group or subgroup. In vaccine therapy for these infections the specific infecting organism must be used.

REFERENCES.—¹*Amer. Jour. Physiol.* 1919, July, 302-339; ²*Internal Secretions*, 1919; ³*Jour. Amer. Med. Assoc.* 1919, Oct. 11, 1139; ⁴*Ugeskr. f. Læger*, 1919, 1595; ⁵*Jour. of Lab. and Clin. Med.* 1920, May, 515; ⁶*Presse méd.* 1919, Nov. 26, 714; ⁷*Policlínico*, 1920, 149; ⁸*Jour. of Lab. and Clin. Med.* 1920, March, 352; ⁹*Brit. Jour. Exper. Pathol.* 1920, 53; ¹⁰*Ann. di Clin. Med.* Palermo, 1919, Oct., 9, and *Jour. Amer. Med. Assoc.* 1920, April 17, 1131; ¹¹*Jour. Amer. Med. Assoc.* 1919, Oct. 25, 1320; ¹²*Amer. Jour. Surg.* (Annes. Suppl.), 1919, 82; ¹³*Med. Record*, 1920, May 8, 784; ¹⁴*Jour. of Lab. and Clin. Med.* 1920, April, 459; ¹⁵*Lancet*, 1920, i, 97; ¹⁶*Presse méd.* 1920, Feb. 7, 104; ¹⁷*Ibid.* 1919, Nov. 29, 725; ¹⁸*Policlínico*, 1920, Feb. 1, 149; ¹⁹*Ibid.* 1920, Feb. 1, 171; ²⁰*Brit. Med. Jour.* 1920, ii, 69; ²¹*Jour. of Lab. and Clin. Med.* 1920, May, 515; ²²*Jour. of Biol. Chem.* 1920, 503; ²³*Ibid.* 567; ²⁴*N. Y. Med. Jour.* 1920, May 9, 795; ²⁵*Presse méd.* 1920, June 2, 353; ²⁶*Ibid.* 1919, Nov. 26, 714; ²⁷*Policlínico*, 1920, Feb. 1, 184; ²⁸*Ibid.* 1920, March 1, 267; ²⁹*Jour. of Lab. and Clin. Med.* 1920, May, 542; ³⁰*Riforma Med.* 1919, Sept. 27, 837; ³¹*Munch. med. Woch.* 1920, July 30, 891; ³²*Ibid.* 279; ³³*Hospital*, 1920, March 3, 532; ³⁴*Jour. of Infect. Dis.* 1919, 114.

UROLOGICAL FINDINGS IN DISEASES OF CENTRAL NERVOUS SYSTEM.

J. Ramsay Hunt, M.D.

Urological recognition of disease of the central nervous system is of such importance that physicians should be keenly alert to it. Caulk, Greditzer, and Barnes¹ have made a comprehensive study of 500 cases of nervous and mental diseases, in the hope of determining definite facts which might serve, in conjunction with our previous knowledge, to insure our intimate acquaintance with this phase of urology.

Of the significant urological observations, the most important are loss of sexual power, relaxation of the rectal sphincter, and the bladder picture as revealed by the cystoscope. The last-named is the most reliable. Cystoscopic findings in diseases of the central nervous system, particularly those affecting the lower segments of the spinal cord, of which tabes dorsalis is the most notable example, are definite, constant, and characteristic. Among urologists, there has been considerable discussion as to the characteristic findings in the bladder in disease of the central nervous system, and most of the previous reports on this subject have dealt with the great importance of trabeculation as being pathognomonic, without regard to the internal sphincter. It is the writers' belief that the internal orifice is equally decisive. The combination of the two, however, really forms the definite cystoscopic picture.

DIAGNOSTIC SYMPTOMS AND FINDINGS.

Urinary Symptoms.—Ninety-three per cent of the patients had urinary symptoms. Seven per cent presented no urinary symptoms. Of the 93 per cent, half were definitely neurological and half unconfirmed. Of the 7 per cent, it was again half and half.

Frequency: Occurred in about 60 per cent, equally divided between the confirmed and unconfirmed.

Incontinence: Occurred in 38 per cent of the series, of which the patients in 63 per cent proved to be those with definite central-nervous-system disease.

Urinary obstruction: Occurred in 36 per cent. Of these, one-half were neurological. In one of the negative cases, however, paresis developed later. Other causes of obstruction associated with this group were stricture, prostatic hypertrophy, bladder tumours, cancer of rectum, cystocele, etc.

Pain, burning, and urgency of urination: Occurred in 41 per cent, and of these the diagnosis in 41 per cent was confirmed.

Sexual Powers.—One of the very important and most uniform findings was disturbed sexual capacity. In about 80 per cent of the cases of organic lesions of the central nervous system there was either complete loss or considerable disturbance of the sexual powers. Of the non-confirmed cases, 50 per cent showed this disturbance.

Pain.—Pain was present in about 70 per cent of all the cases—the lightning pains of tabs, and pains in back, legs, perineum, pubis, scrotum, and rectum.

Uræmia.—One of the chief factors in the production of toxicities in patients suffering from central-nervous-system disease is uræmia. It not only manifests itself with the ordinary obstructive-type symptoms, but serves to augment many of the toxic pains from which these patients suffer.

Hæmaturia.—This occurred in 15 per cent of the series, one-third being in tabetics and two-thirds in non-tabetics.

EXAMINATION.

External Genitals.—These are frequently flabby. Varicocele is common. Various degrees of penile atrophy have been noticed, and in several instances there have been marked spasms of the whole anterior urethra, so that it was difficult to insert a catheter, and more difficult to remove it.

Urine.—Thirty-two per cent of the patients in all the cases had infected urines; 66 per cent of these were tabetics; the remainder, the unconfirmed. Furthermore, 40 per cent of all tabetics had infected urines; 60 per cent had not. The infections were almost entirely of the colon bacillus group.

Prostate and Vesicles.—Sixty-eight per cent of the patients had prostatitis and vesiculitis. This percentage was divided equally between the confirmed and unconfirmed. About 5 per cent of the patients with definite cord lesions had an associated prostatic hypertrophy. This is very important, and serves to emphasize the necessity of thorough recognition of this bladder picture and the advisability of always making a cystoscopic examination prior to prostatic surgery, since the symptoms which seem to be due to the prostate may have their origin in a nerve lesion.

Rectal Sphincter.—This offers itself as an extremely important symptom, and often creates the first inkling of suspicion. In their series it was relaxed in 88 per cent of the cases.

Internal Sphincter and Verumontanum.—In this series the internal sphincter was found relaxed to various degrees in 98 per cent of the cases. About 79 per cent of these relaxations were such as to allow cystoscopic inspection of the verumontanum. The diagnosis in 40 per cent of these cases was neurologically confirmed; in the remainder it was not. But 80 per cent of the tabetics had sufficiently relaxed sphincters to allow inspection of the verumontanum, and 20 per cent had not. This high percentage of relaxation of the internal sphincter in diseases of the nervous system places it as one of the most important criteria.

Trigone.—The trigone was elevated and spread out like a fan in 56 per cent of the cases. Of this number, 56 per cent occurred in diseases of the central nervous system.

Trabeculation.—Trabeculation was present in more than 90 per cent of the cases. Of these, 46 per cent were confirmed. On the other hand, trabeculation was reported in 96 per cent of the patients with diseases of the central nervous system.

TREATMENT.—These patients should be kept under very strict hygiene, and their diet and bowels carefully regulated. Urinary antiseptics, particularly Acid Sodium Phosphate in 20-gr. doses, and Hexamethylenamine in 10-gr. doses, three times a day, are helpful in the infected cases, and serve as preventives in the uninfected.

Local Treatment.—It must be understood that the treatment of a bladder lesion secondary to an old nerve lesion is entirely different from that of one due to traumatic injury. It has been definitely shown that the latter group should be left alone, as the automatic bladder will usually develop, and the condition will frequently take care of itself.

The lesion which is secondary to an old nerve lesion, on the contrary, demands a different therapeutic regimen. The method of treating such bladders varies according to whether or not there is residual urine. This difference in treatment, of course, is in the employment of systematic catheterization in those patients with residual urine. Otherwise, the treatment is similar, consisting, in the first place, in relieving irritability, in keeping the patients clean, and in training them to exercise their enfeebled musculature by regular, systematic attention to urination, and by practising stopping and starting the urine at frequent intervals. This is designed to give more muscle tone and power to the fibres not involved, and, by means of such compensation, enable them to replace the loss of fibres which are destroyed, thereby preventing their injury from overstretching as a result of a chronically distended bladder. These patients should all receive systematic treatment for the prostate and the bladder neck, such as massage, dilatation, instillations, and applications to the urethra; and even though instrumentation has been tabooed for this class of patients, we feel that it has been on unjust grounds, since the benefit derived is entirely out of proportion to the slight trouble it may cause.

Patients with residual urine, whether infected or not, are treated by regular catheterization and irrigations: this for the purpose of relieving the internal pressure and allowing the overstretched muscles which are not neurologically involved to regain control.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1919, Nov. 22, 1594.

UTERUS, DISORDERS OF.

W. E. Fothergill, M.D.

Functional Bleeding.—Emil Novak¹ writes on the relation of hyperplasia of the endometrium to so-called functional uterine bleeding. He points out that in certain cases uterine bleeding is clearly and definitely explained by local lesions such as cancerous ulcerations. In others bleeding is associated with gross pelvic lesions such as those produced, for example, by pelvic infection; but the mechanism by which bleeding is produced in these cases is not so clear. Is it due to mere exaggeration of menstrual hyperæmia or to disturbance of the ovarian function? Hyperæmia of itself does not always cause bleeding, while severe hæmorrhage is often associated with old low-grade inflammatory conditions in which there is little or no hyperæmia. Again, inflammation does not cause uterine bleeding in persons past the menopause—that is, past the cessation of ovarian function. The removal of the ovaries, again, will always check uterine bleeding of the kind in question. So-called functional uterine bleeding is excess of menstrual bleeding. It is allowed that normal menstruation is a result of ovarian function. Is not excessive menstrual bleeding a result of disordered ovarian function? In cases of this kind no demonstrable pelvic disease exists. They occur at puberty, at the menopause, and also at any period during reproductive life. Novak's first point is that this so-called functional bleeding is very often associated with hyperplasia of the endometrium (not, he specially points out, with the old-fashioned hypertrophic glandular endometritis—a mere phase in the menstrual cycle). In this condition there is a genuine proliferation of the whole endometrium. The epithelium is thick and compact; the glands vary from small to large, with smooth walls; the stroma is abundant and compact, resembling that usually found in the deeper layers of the endometrium. This condition, in Novak's

experience, is never found without uterine bleeding as a symptom. It occurs in uteri which are otherwise normal, as well as in association with myoma and adenomyoma. It has usually been regarded as a local lesion, primary in nature, a sort of diffuse adenoma of the endometrium.

The present suggestion is that, as the endometrium is only the creature of the ovary, this hyperplasia of the endometrium is a phenomenon secondary to a disorder of the ovarian function. The following facts are adduced in support of this view: (1) Functional bleeding may occur at any age during reproductive life, but is common at puberty and at the menopause—the same statement is true of hyperplasia of the endometrium; (2) The condition occurs in very young subjects together with other indications of ‘endocrinopathy’; (3) The condition does not occur after the menopause, and it can always be ended by removal of the ovaries; (4) Hyperplasia and the associated bleeding are not usually cured by curettage, the endometrium removed being replaced, as a rule, by a similar one; (5) By curetting in these cases, the condition is attacked at the wrong end, for it merely removes the endometrial manifestation of the underlying endocrine cause; (6) Radium and α rays destroy the Graafian follicles and exert a most beneficial effect upon bleeding of this kind. The writer goes on to various theoretical considerations, but is not able to say whether the ovarian disorder in question is in the nature of excessive or diminished function; he says, however, that it would seem logical to ascribe excessive menstruation to excessive ovarian secretion. “No explanation of normal menstruation is adequate unless we assume the presence in the endometrium of some local factor that makes the endometrial vessels much more permeable at the menstrual period than at other times. It is possible that the same factor is responsible for the non-coagulability of menstrual blood.” A solution of the problem of menstruation would also be an explanation of excessive menstrual bleeding.

Radium in Uterine Bleeding.—S. M. D. Clark² has used Radium in 51 cases of uterine bleeding from causes other than carcinoma or myoma. He has treated girls of 12 and 16 years of age and other young women. In one case menstruation returned to its normal habit, while in the others it ceased altogether. In cases aggravated by severe dysmenorrhœa, complete relief is said to have been secured with complete cessation of the menses in some of the cases. In so-called ‘chronic metritis’, inflammatory diseases must first be eliminated; next an exploratory curettage must be done in search of malignancy; then, by the application of radium, the menstrual life is brought to a close. There were 35 such cases treated, with one partial failure; the results were secured, the author considers, more safely and pleasantly than by supravaginal hysterectomy. Short notes of 51 cases are published, and show that the premature menopause was brought about in several cases which would probably have recovered without the loss of the reproductive function under other lines of treatment. It is clear, however, that radium is very useful in cases of uterine hæmorrhage at the menopause.

Radium in Myoma.—J. G. Clark³ has observed the effects of Radium treatment in 150 cases of myoma and myopathic uterine bleeding. He warns against the method in young women, as it is able to bring on ‘an abrupt and serious menopause’ and to upset the ‘nervous equilibrium’. In women at the menopause he finds that the myoma must not be complicated by inflammatory trouble, must be causing hæmorrhage, and must not be too large. In cases in which pain has been present it has seldom been relieved. The tumour should not be larger than a three- or four-months pregnant uterus. Indications of toxæmia out of proportion to the anæmia produced by the hæmorrhage also contra-indicate radium treatment. It is also excluded by co-existent

cholecystitis, cholelithiasis, appendicitis, and other inflammatory troubles. Clark does not look with favour upon the conversion of large tumours by radiation into retrogressive tissues which, through absorption, may cause toxic symptoms. Nausea is often experienced within forty-eight hours of radiation, but is not severe. Pain is also complained of in some cases. Leucorrhœa follows the treatment, and persists for two or three weeks; bleeding does not always cease at once, though it does so as a rule. The menopause varies in the severity of the symptoms, as it does when due to natural or other causes.

Curettage.—A Heineberg¹ calls uterine curettage a 'bad habit', and recalls the words written forty years ago by Emmet, who seems to have thought that the curette was invented by Marion Sims: "As regards the instrument of Dr. Sims, I honestly believe that the ingenuity of man has never devised one capable of doing more injury". He also quotes Polak's recent utterance: "It seems almost impossible to educate the profession to the acceptance of the fact that the curette has but two well-defined indications: first, to remove the products of conception before the eighth week; and second, to make the diagnosis in intermenstrual bleeding near or after the menopause". After giving a summary of the normal gross changes in the endometrium during the menstrual cycle which used to be regarded as varieties of 'endometritis', Heineberg says that the conditions for which the curette is often used may be divided into two groups: (1) Dysmenorrhœa, acute anteflexion, sterility, leucorrhœa; (2) Menorrhagia, metrorrhagia, purulent discharge. He considers that the benefit occasionally secured in dysmenorrhœa is due to the dilatation of the cervix and not to the removal of the endometrium. He condemns the common mistake of curetting for sterility due to the husband or to recognizable and gross abnormalities in the wife. Kelly has shown that less than 15 per cent of women curetted for sterility subsequently became pregnant. As to leucorrhœa, Heineberg denies that the discharge ever comes from the body of the uterus, so that curettage is futile. Rawls made a critical review of 6219 curettings done in eleven years in the Women's Hospital, New York. He concludes that 96 per cent of gynæcological cases show no endometrial change, and that curettage is of doubtful value in the remaining 4 per cent. Heineberg concludes: "The statistics of Cullen, Norris, and Rawls, combined with the studies of Curtis, present a strong condemnation of that pernicious and thoughtless practice which includes curettage as a routine measure in most operations upon the pelvic viscera".

J. Wesley Bovée² gives a 'warning against promiscuous curetting'. His principal use for the instrument is to secure tissue for microscopical study. He specially deprecates the routine curettage done as a preliminary to plastic vaginal operations, and objects to it as dangerous in incomplete abortion, clean or septic, unless in cases of very dangerous hæmorrhage. Bovée refers to the numerous disasters which have followed the perforation of the uterine wall by the instrument. He then quotes the findings of Curtis as to the bacterial content of the endometrium. In 26 nulliparæ with no history of infection, 23 uteri contained no organisms, 1 contained streptococci, and 2 contained mixed organisms. These two had been recently curetted. [They were probably curetted because they were already infected.—W. E. F.] In 13 nulliparæ with history or gross evidence of infection, 12 uteri were sterile, and 1 contained gonococci. [This shows that the endometrium soon becomes sterile after it has been infected.—W. E. F.] In 47 parous women without history of infection, 43 were sterile; and in 32 parous women with history of infection, 23 were sterile, and 9 contained growths of various organisms. Curtis concludes that most women's uteri are sterile, and that patients with a history of chronic infection from whose uteri bacteria are obtainable, almost

all have salpingitis; further, that, pyometra and recent infections excepted, the endometrium almost never shows bacteria except when there is infection of adjacent pelvic tissues. Chronic endometritis, *per se*, is therefore practically to be ruled out as a clinical entity. Bovée argues that if there is no infected endometrium except in cases with other pelvic foci of infection, curetting is useless in the majority and dangerous in the remaining cases.

Busse found only 10 per cent of cures in 505 cases of curetting for uterine hæmorrhage; while Schickele and Keller record 38 successful and 61 failures in 111 cases. Thus, in cases of functional bleeding, as a rule the only thing gained by curetting is the information that the case is functional and not due to any recognizable local lesion.

[Recent writers, in the swing of the pendulum away from curettage, have gone too far as to the dangers and risks of the operation, and they propose to limit the indications for it with too great stringency. Writing on the use and abuse of the curette myself⁶ before the present crusade against it began, I mentioned various conditions which should not be curetted, e.g. : (1) Leucorrhœa, or 'the whites', for the discharge comes from the vagina and not from the uterus; (2) Congestive dysmenorrhœa; (3) Dull aching pain in the sides—varicocele, in short; (4) Menorrhagia following an illness such as influenza; (5) Menorrhagia following shock such as a railway accident; (6) One-child sterility, menorrhagia, or dysmenorrhœa in a patient who has a tubo-ovarian swelling. But exploration of the uterine cavity is the proper course whenever, in the absence of any gross pelvic lesion, there are signs that the endometrium is abnormal. If this general rule is observed, many cases of early malignant disease are discovered. And this is the answer to those who object to curetting as a preliminary to prolapse operations. I have found three cases of cancer of the body of the uterus within the last year when curetting merely to make sure that the uterus is normal before operating for prolapse. Polypi are also removed by the curette very often on these occasions. No doubt the most frequent use of the curette is for the removal of retained products of conception, and with these should be remembered the decidua, which is not always shed in abortion. When old ladies have a discharge of pus and blood, the use of the dilator and the curette often gives at one sitting the diagnosis and cure of pyometra, and saves the patient the discomfort and risk of a pan-hysterectomy done for an imaginary cancer of the corpus uteri.—W. E. F.]

Hysterectomy: the Artery of the Round Ligament.—J. F. Baldwin⁷ says that every modern text-book directs that the round ligament be tied to control bleeding from the artery which is supposed to run in that ligament and to form an important part of the blood-supply of the uterus. He finds, however, that no blood reaches the uterus by way of the round ligament, but that on the contrary, a minute artery carries blood from the uterus to the ligament. The blood-supply of the ligament is scanty, and is purely for the nourishment of the part and not for distribution to parts beyond. E. C. Buck, Professor of Anatomy in the Ohio State University, has described for Baldwin the anastomoses between the various neighbouring arteries which form the blood-supply of the ligament. Any of the vessels may become enlarged in diseases of the uterus, ovaries, and tubes, and may require ligature. But Baldwin says he has done thousands of pelvic operations, and has only once seen arterial bleeding from the round ligament. He hopes that, after Buck's authoritative demonstration, writers and operators will correct the error into which they have fallen, and will save space in books, and time and catgut in operating. [Baldwin is quite right. It is sufficient, in most cases, to include the cut end of the round ligament in the continuous suture which 'peritonizes' the wound after the removal of the uterus.—W. E. F.]

Radium in Uterine Cancer.—Radium has proved to be useful in advanced and inoperable cancer of the cervix, and the question now arises whether it does not give better results than operative treatment in early and operable cases also. Evidence has accumulated which demands full consideration.

H. Bailey,⁸ in a long and careful paper, deals with 336 cases treated between January, 1915, and May, 1919. He says that practically all that have a complete radiation of the local lesion and the lymphatic and other involved tissue pass through a period of improvement. Disappearance of ulceration, lessening or disappearance of discharge, gain in weight, and improvement of health are secured in all but the most advanced conditions. There is often slight rectal irritation lasting two or three weeks. A few patients have a fibrosis of the pelvic connective tissue, especially at the bases of the broad and uterosacral ligaments. After a longer or shorter time of well-being, many of the cases have further development of cancerous tissue behind the vault of the vagina. Bailey wonders whether in cancer of the cervix radium alone is not as good as the most complete hysterectomy of the Wertheim type. In cancer of the corpus uteri complete radiation is more difficult, and he thinks the uterus should be removed after preliminary radiation. But, so great has been the palliation from radium, that it may be said that no uterine cancer receives proper treatment without thorough radiation of the tissues of the pelvis.

H. H. Janeway,⁹ head of the radium department, Memorial Hospital, New York, gives a careful review of the results secured by the **Radical Operation**. He finds that of 5027 cases, 1720, or 34.21 per cent, were operable. Of 1997 cases, the mortality was 364, or 18.23 per cent. Of 1090 cases, there were 386 cures (mostly of five years' standing), namely 35.41 per cent of traced cases, or 19.32 per cent of cases operated on. In short, 11.72 per cent of cases applying for treatment were cured. Vaginal surgery cured less than this percentage of cases of cancer of the cervix. [Cancer of the body of the uterus is a different thing altogether, for the mortality of abdominal operations for it is only 8.19 per cent, and 61.15 per cent of operations for it cure the patient, 53.03 per cent of those applying for treatment being cured.—W. E. F.] Janeway points out that the high mortality of the abdominal operation, still about 20 per cent in skilled hands, restricts the use of the operation to very few surgeons. Again, it is only suitable for a small percentage of the most favourable cases. The operation, and especially its sequelæ, cause much suffering. Von Rosthom reports 42 per cent of sequelæ, including ureteral and vesical fistulæ, necrosis of bladder, injury to rectum, fistulæ of intestine, and division of the obturator nerve. Weibel reports 6 per cent of ureterovaginal fistulæ from Wertheim's own clinic. Clark reports sequelæ in 22 out of 36 patients, including suppuration of the incision, cystitis, peritonitis, vesical fistulæ, phlebitis, laceration of rectum, pleurisy, and rectovaginal fistulæ. In fact, the patient who undergoes a Wertheim operation faces a 1 in 5 risk of death, the risks of all these sequelæ, and then has the rather small prospect of permanent cure, the alternative being a lingering and painful death.

Wickham is the father of the radium treatment of cancer. He began his work in 1906, and published the results in 1000 cases in 1910 and 1913. Reports by various workers have appeared every year subsequently, but cures of five years' duration are only now becoming numerous, and opinions expressed are cautious or enthusiastic according to the temperament and experience of the worker. Janeway gives in detail 30 cases of his own, and concludes his important paper with a discussion on the technique of various workers which should be consulted by radiologists. His message to gynaecologists and practitioners is that the case is so strong for the use of radium in

operable cancer of the cervix that the choice of the method instead of operation is justified, even in early cases.

H. Schmitz¹⁰ writes fully on technique, and describes in detail the method he is now using, giving tabular statements of results. He considers that "patients treated with radium only, and not subjected to panhysterectomy, excochleation, or cauterization, have a better chance all round". "If local healing is obtained, we should not subject the patient to an unnecessary operation. Preliminary excochleation and cauterization also do not offer the patient any additional benefits. They render her chances less favourable in spite of added physical and material sacrifices."

John G. Clark,¹¹ after five years' experience with radium, considers it to be an adjunct of surgery and not its competitor in the treatment of tumours of the pelvic organs. Two years ago Clark concluded that: (1) As a palliative remedy radium is the treatment *par excellence* in inoperable cases of cancer of the cervix. (2) In border-line cases in which formerly we accepted the grave risks of an operation in hope of eradicating the disease, we now employ radiation; but in the certainly operable class we still advocate a radical operation followed by post-operative radiation. (3) In cancer of the fundus, even when far advanced, we perform a hysterectomy, resorting to radium therapy only in the face of grave operative contra-indications. He now adds a fourth conclusion: "As yet we claim no cures, but, based upon the observation of a considerable number of operable cases which have remained locally healed from one to three years, we venture to hope that the quinquennial test will find several survivors".

J. L. Ransohoff¹² has a small series of cases, of whom 19 per cent remain free from recurrence after periods of two and one-half up to five and one-half years. He considers the results of the radical operation, and points out that with radium therapy practically all the patients are relieved, and scarcely any are made worse by the causation of pain or the production of fistulæ; while, after operation, 18.25 per cent die at once, many have painful and annoying sequelæ, and only 11 per cent are cured.

Dr. Burrows,¹³ in a personal communication, writes on this subject as follows:—

In Manchester, from 1915 to 1919, 363 cases of carcinoma of the cervix of the uterus were treated by radium. Practically all these cases were inoperable. About 10 per cent show a complete disappearance of symptoms and signs, but at least a half of them recur within twelve months. Technique is steadily improving, and earlier cases are not fair tests of present methods, but even then 1 case has been well five years and 5 more between three and four years. Again, several cases operated upon after the application of radium have been well two years or more.

Microscopic sections taken after these hysterectomies usually showed complete fibrosis of the cervix, in which no malignant cells or only a few degenerated ones could be seen. The range of action of the radium rays appears to be considerable, but an exact statement cannot be made at present. It is certain that all mathematical formulæ giving the area effectually irradiated by radium are fallacious, as so many factors are involved, some of which are quite without measure or knowledge at present. So the problem still remains: Can a dose of radium be given which is efficacious through a mass of tissue as large as, or larger than, the Wertheim hysterectomy involves?

It is necessary that definite opinions should not too readily be formed, because, as in all branches of medicine, cases occur in runs or groups, some satisfactory and some otherwise. This should particularly be borne in mind,

as some of the treatments given in papers appear to be inadequate; consequently it is to be suspected that the authors have not yet come upon their bad time. Dr. Janeway's paper is one to be picked out among other satisfactory ones. It is exhaustive as far as present knowledge goes, and deals with many cases. In it, however, the most striking thing is really his relative condemnation of Wertheim's operation, alongside of the figures of which the radium statistics, taken from wide sources, show up very well, especially when it is remembered that the Wertheim cases are picked and the radium ones are not so. It seems probable that, with improving technique and the application of radium to all operable cases, even better records will be obtained for radium, and those for Wertheim's hysterectomy be eclipsed; but it is as well still to be cautious, and not to condemn root and branch the operative treatment.

At the present moment it is safe to say that radium is far better treatment for carcinoma of the cervix than relatively unskilled operation, and that it will remove practically all early cases of cervical cancer, the duration of the effect remaining to be seen. It is also the best treatment for borderline cases, and for those patients whose general health will not permit of a severe operation. Lastly, it is the palliative treatment of advanced cases *par excellence*, giving even in these a ray of hope from the point of view of cure.

(See also section RADIOGRAPHY AND ELECTROTHERAPEUTICS, p. 33.)

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1920, July 31, 292; ²*Ibid.* 1919, Sept. 27, 953; ³*Ibid.* 957; ⁴*Therap. Gazette*, 1920, Aug., 538; ⁵*Surg. Gynecol. and Obst.*, 1920, June, 618; ⁶*Med. Press and Circ.* 1918, March 13; ⁷*Surg. Gynecol. and Obst.* 1920, July, 57; ⁸*Amer. Jour. Obst.* 1919, Sept., 300; ⁹*Surg. Gynecol. and Obst.* 1919, Sept., 242; ¹⁰*Ibid.* 1920, Aug., 177; ¹¹*Ann. of Surg.* 1920, June, 688; ¹²*Jour. Amer. Med. Assoc.* 1920, Jan., 163; ¹³*Ann. Reports of the Manchester Radium Institute.*

VACCINATION.

J. D. Rolleston, M.D.

Commenting on Wurtz's recommendation that primary vaccination should be made compulsory between ten days and three months of age, Camus¹ sets forth the following objections to the proposal: (1) The drawbacks to vaccination before the end of three months. According to accoucheurs, however, these are not very numerous. (2) Failure to 'take' is frequent before the age of three months. Kelsch estimates the percentages of failures at this age as 31 per cent greater than in older children. (3) Infants under three months of age have nothing to fear from small-pox. In the severe epidemic at Marseilles in 1828 there was not a single patient under three months among more than 10,000 cases of small-pox. The resistance of the newborn to vaccinia as well as to small-pox is an example of the relative immunity at this age to infectious disease. On the other hand, the advantage of early vaccination is that many infants would never be vaccinated if the operation was not performed in a maternity hospital. Camus emphasizes the fact that the younger the child the less receptive it is to vaccination, so that it is essential to select a recent and active lymph for vaccination of children under three months of age.

REFERENCE.—¹*Bull. de l'Acad. de Méd.* 1920, i, 35.

VARICELLA.

J. D. Rolleston, M.D.

SYMPTOMS.—The eruption of varicella, like that of small-pox, shows a tendency to become confluent in regions where the skin has been irritated, e.g., by the application of iodine, scratching flea-bites, or eczema. P. Gautier¹ records two cases in children in whom the eruption was remarkably thick on the back and shoulders, which had been irritated by exposure to the sun.

Stoeltzner² draws attention to the increasing severity of varicella within recent years, as shown by the more profuse eruption, the resemblance of the

individual lesions to those of small-pox or vaccinia, severe constitutional disturbance, and frequency of scar-formation. In one of his cases the prodromal fever was so pronounced that the diagnosis of small-pox would have been made had not the child been successfully vaccinated recently. Another case was complicated by staphylococcal pyæmia, manifested by multiple subcutaneous and intramuscular abscesses; and in two other cases a relatively mild tuberculosis was unfavourably affected by the supervention of variella.

A case of *retinitis* complicating a very severe attack of variella is reported by Paton³ in a boy, age 14. On the third day of the illness the left eye was found to be blind, and sight had remained defective in it ever since. Four months after the attack the left optic disc was found to be pale, while the right was normal. There was no evidence of organic renal disease.

In an epidemic of 32 cases of variella, Arkenau⁴ found *accidental rashes* in the form of an erythema, which was sometimes scarlatiniform, in 6 patients, or 19 per cent. All the children in whom it occurred had severe attacks. In one there was no variella eruption at all. [If the diagnosis can be accepted, this was an example of the rare condition *variella sine varicellis*.—J. D. R.] In another there were only a few vesicles, while in the other four cases the vesicles were more or less abundant. The duration of the erythema varied considerably. While in 1 case it disappeared on the same day, in 3 it lasted three days, and in 2 eight days. In 4 cases it was accompanied by a transient edema of the face and hands.

C. B. Ker⁵ discusses the relationship between herpes and variella (see MEDICAL ANNUAL, 1919, p. 464; 1920, p. 386), and comes to the following conclusions: (1) Cases of variella followed by herpes, and simultaneous attacks of herpes and variella in different individuals, may be explained by coincidence. (2) Co-existence of herpes and variella may be explained either by variella starting from some unknown reason with a herpetic distribution, or by the phenomenon of generalized herpes. (3) It is difficult to give an adequate explanation of the larger number of cases reported in which variella has followed herpes in another individual within the limits of the incubation period of the former disease. It is possible that the same virus may behave quite differently under different conditions.

The relation between variella and herpes zoster is also discussed by Netter,⁶ James Taylor,⁷ and McEwen.⁸

REFERENCES.—¹Arch. de Méd. des Enf. 1919, 657; ²Munch. med. Woch. 1919, 1165; ³Proc. Roy. Soc. Med. (Ophth. Sect.), 1918, 12; ⁴Monats. f. Kinderh. 1920, 332; ⁵Lancet, 1920, ii, 347; ⁶Bull. de l'Acad. de Méd. 1920, i, 588; ⁷Brit. Med. Jour. 1920, ii, 436; ⁸Arch. of Dermatol. and Syph. 1920, ii, 205.

VARICOSE VEINS. (See VASCULAR SURGERY.)

VASCULAR SURGERY.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Varicose Veins.—Military regulations necessitate surgical intervention in a number of cases of young recruits. Varicose veins often develop in athletes; possibly an increased arterial pulsation transmitted reflexly to the veins causes an active hypertrophy. In addition, muscular contractions drive more blood out from the deep veins into the superficial veins. Perthes thought that if a patient stands up until the veins are full and then a pad and bandage is applied over the saphenous opening, the vein will become less distended when walking if the valves are incompetent, owing to the blood being sucked into the deep vein. A cough impulse normally limited to the saphenous opening may be felt down the course of the vein as low as the knee when the valves are faulty. In all cases two or three inches of vein should be removed just below the saphenous opening; in addition to this, the best result will probably be

obtained by adopting Mayo's plan of making two short incisions, and passing his ring-ended enucleator over the vein, which frees it subcutaneously and permits removal *in toto*. In the writer's opinion Babcock's operation is satisfactory, the knob-ended probe being passed within the vein for its entire length. In a suitable case the probe can be entered at the saphenous opening and passed through the vein to the level of the internal malleolus. The lower end of the probe is exposed through a small incision and forcibly pulled out for its entire length, carrying the vein with it. This operation cannot be done if the veins are tortuous. Neglected cases become complicated by solid œdema passing on to elephantiasis.

Kondoleon, of Athens, made longitudinal incisions (in cases of filarial origin) through the thickened and œdematous skin down to the deep fascia, from which a strip was excised. The muscles then bulged and came into contact with œdematous subcutaneous tissue. The application of Kondoleon's procedure may be a means of affording relief and avoiding amputation in bad cases of œdema and ulceration secondary to varicose veins.

Coopernail¹ recommends the marking of varicose veins before operation with brilliant-green aqueous solution. The veins should be marked out the day before the operation, and let dry before the clothing touches them. At the time of operation they can be painted with iodine; the vessels show beautifully through the iodine, as green intensifies most colours. It is almost impossible to wash off this stain with alcohol, ether, etc., and it takes several weeks for the stain to wear off. It is suggested by Buchanan that the same method would be useful in marking the scalp prior to intracranial operations.

Physiological Methods in the Treatment of Varicose Ulcers.—Varicose ulcers are the result of circulatory stagnation due to some obstruction in the internal saphenous or femoral vein. The normal valvular action is overcome, with resulting engorgement and passive congestion of the leg. To correct this condition the circulation to and from the ulcerated area must be corrected.

R. J. Behan² advises making numerous straight incisions about the area and severing the vessels communicating beneath the ulcer by means of a fine narrow knife. In the slowly healing ulcer, repair may be stimulated by the use of skin-grafts from various parts of the body. The proliferating epithelial margin of an indolent ulcer is active in its growth, needs little nutrition, is accustomed to the location in which it is situated, is immune to the pus secretions of the area, possesses great resistance, and is not sensitive. The author's method of treating varicose ulcers is described as follows:—

1. The ulcerated area is made as aseptic as possible, and the granulation tissue is removed below the level of the margin.

2. The skin margins are undermined, the bleeding being controlled by pressure.

3. Squares measuring $\frac{1}{4}$ in. are cut from the margins at distances of $\frac{1}{4}$ in. These are placed over the ulcerated area not more than $\frac{1}{2}$ in. apart, pressed firmly to the surface, and covered with a protective elevated dressing.

4. The area is kept moist with salt solution or Ross's solution, and is protected from pressure and traction. Exposure to sunlight under glass, isinglass, or cello-silk dressing is of great benefit. The growth of the body-cells is stimulated by a secretion from the dead or dying body-cells, called by Ross 'cadaverin'. Theobromine also acts as a stimulant to cell-growth. Ross uses a paste and a solution the formulæ of which are as follows : *Solution* : Sodium chloride, 0.5 grm.; sodium citrate, 1 grm.; theobromine, 1 grm.; water, 100 c.c. *Paste* : Sodium chloride, 0.9 grm.; sodium citrate, 1 grm.; tyrosine or theobromine, 1 grm.; sodium bicarbonate, 1 grm.; and water, 100 c.c. (See also ULCER OF LEG.)

Aneurysm.—Marble and White³ report a case of *traumatic aneurysm of the right pulmonary artery*. The patient, in 1918, had a perforating gunshot wound in the right chest, and double pneumonia. The condition is extremely rare, and the interesting points in the case are that the *x-ray* plates showed a spherical area of shadow at the root of the right lung; at the angle of the right scapula there was a murmur like the roaring of dynamos that were intermittent; there was hæmorrhage once a month; and the patient died from hæmorrhage five months after being wounded. Fifty-six cases of aneurysm of the pulmonary artery or of its main branches have been reported, only one of which was of traumatic origin.

William Pearson⁴ describes a case of *subclavian aneurysm treated by distal ligation*. A large rounded tumour occupied the lower part of the posterior triangle of the neck, presenting most of the classical signs of aneurysm. An attempt was first made to apply a proximal ligation, but the condition of the vessel back to its origin from the innominate was such as to render this operation impracticable. A month later the first stage of the axillary artery was tied, and twenty-four hours later there was no pulsation or murmur in the aneurysm. The circulation of the limb never caused any anxiety. Sixteen weeks after operation there was no swelling or pulsation in the subclavian region. So satisfactory a result of distal ligation, a minor operation as compared with proximal ligation in the case of subclavian aneurysm, is of great surgical importance.

Entrance of Air into a Vein.—Great stress was laid by writers of the last generation on the danger of air entering a vein. The reviewer has never seen a case, and he has never taken any precaution to prevent it during dissections of the neck or elsewhere. Air-embolism may very rarely occur; but to judge from the writings of the older surgeons one would think that it was an ever-present danger. Miles⁵ describes a case as follows: While clearing the axilla in the course of an operation for cancer of the breast, a large gland was found adhering to the axillary vein, and, in attempting to separate it, a narrow slit was made in the wall of the vessel. A finger was immediately placed on the hole in the vein, and, on removing it to apply forceps, a short high-pitched hissing sound, almost amounting to a whistle, was audible to those around. The finger was immediately replaced on the proximal side of the opening, and the sound ceased. The anæsthetist, Dr. J. H. Gibbs, who heard the sound and suspected its cause, observed no change in the patient's appearance, and neither the pulse nor the respiration was affected. While a lateral ligation was being applied to close the opening in the vessel wall, I became conscious of a curious rhythmical swishing sound proceeding from the patient's chest. This became louder and louder till it was quite audible to everyone present. On listening directly over the heart, the sound suggested the churning of a frothy mass within the cavities. It reached its maximum in about a minute, then gradually disappeared. There was never any detectable change in the pulse or respiration; and the blood, which continued to ooze from the surface of the wound, was unaltered in appearance. The patient showed no ill effects either at the operation or afterwards. There seems no doubt that the sounds we heard were due to the entrance of air into the vein and its mixture with the blood in the heart. Fortunately the quantity of air indrawn was not sufficient to give rise to serious symptoms, but the incident is a reminder that this accident may occur.

(See also GAS EMBOLISM OF THE LATERAL SINUS, p. 158.)

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1919, Oct., 423; ²*Amer. Jour. Surg.* 1920, xxxiv, 106 (abstr. in *Surg. Gynecol. and Obst.* 1920, Aug., 129); ³*Jour. Amer. Med. Assoc.* 1920, June, 1778; ⁴*Dublin Jour. Med. Sci.* 1920, Nov.; ⁵*Edin. Med. Jour.* 1920, Jan., 39.

VELDT SORE.

E. Graham Little, M.D., F.R.C.P.

Craig¹ investigated 197 of such sores occurring in European troops, the symptoms of which were very similar. The initial lesion was a vesicle centring round a hair. This would burst, forming a shallow ulcer, which was usually singularly painful, and sometimes a greyish membrane would form on the ulcer, which was essentially chronic. Bacterial cultures demonstrated, in 67 per cent of these, one or other of two types of bacillus which the author regards as identical, a short Gram-positive bacillus negative with Neisser's stain, and a bacillus morphologically indistinguishable from true Klebs-Löffler; and experiments on guinea-pigs corroborated the identification with that organism. Treatment with Antitoxin was highly successful, the average dose being 4000 units.

Sores analogous to Veldt Sores.—Dale Logan² met with so special a group of septic sores in men engaged in tunnelling in blue clay and chalk that he regards them as a class apart, probably essentially similar to veldt sore and Barcoo rot. The first symptom was usually a blister with a surrounding area of inflamed skin. The blisters would enlarge rapidly, and, on opening, thin watery pus would be evacuated. Not infrequently deep ulcerations would result, without much constitutional disturbance or enlargement of glands. He considers the factor of diet, which was supposed to play an important part in the production of veldt sore in the South African War, but is not convinced that this is a feature of his group, and attaches more weight to the factor of personal cleanliness. Analyses of the clay in which these men worked showed a high content of sulphuretted hydrogen or sulphur dioxide. Moreover, the fine grain of the clay gave it the well-known drying effect seen in fuller's earth, and especially the property of removing oil from the surface, which would explain the excessive dryness of the skin noted in these men. Bacteriological examination of the septic sores showed *Staphylococcus aureus* in every instance, and only in a few cases streptococcus.

TREATMENT.—Unbroken blisters were clipped away with scissors, and the seropurulent contents evacuated. Where the blister had already burst, all loosened epidermis was removed. The raw surface thus exposed was swabbed over with spirit or hydrargyri perchloridi solution (1-2000). B.I.P.P. was then applied, combined with the administration of Vaccine, as suggested by Major Adrian Stokes, who kept the medical officers supplied. This was the routine treatment adopted by the medical officers of tunnelling companies, who were all agreed regarding its efficiency. Experience proved that the following method of dosage was most effective:—

1st day	..	200 million	= 0.2 c.c., or 4 minims	..
2nd day	..	300	" = 0.3 "	6 "
3rd day	..	500	" = 0.5 "	9 "
7th day	..	500	" = 0.5 "	9 "
12th day	..	1000	" = 1.0 "	18 "

There was very little reaction, so that the men did not object to this line of treatment. It provided an immunity against staphylococcus sufficient to cure the sores and to protect against further infection for a period of four to six months. This period was not definitely established; it appeared to vary, and in some cases was longer than six months. Where there was a return of the sores, an initial dose of 0.5 c.c. was given, followed in five days by 1 c.c. A single dose should never exceed 2 c.c. Some of the medical officers commenced with 0.4 c.c., increasing up to 1.5 c.c.; they contended that they got quicker results in this way.

REFERENCES.—¹*Lancet*, 1919, ii, 478; ²*Glasgow Med. Jour.* 1919, Dec., 257, and 1920, Jan., 13.

VERTIGO. (See also EAR, INNER.)

J. Ramsay Hunt, M.D.

The relation of *errors of refraction* to vertigo is emphasized by C. E. Pronger.¹ In cases of supposed neurasthenia with vertiginous seizures, the correction of slight errors of refraction has relieved the symptoms. This has also been true of other morbid conditions, and the inference is that in no case of vertigo should one neglect a careful ophthalmological examination and the correction of even mild refraction errors, which under ordinary circumstances might appear insignificant.

Sydney Scott,² in a discussion of vertigo, quotes Sir Wm. Gowers to the effect that 99 out of 100 cases in his experience were of aural origin. After disposing of the various organic affections of the ear which may produce the symptom, he emphasizes more particularly *unilateral Eustachian inefficiency* as a potent factor in the production of vertigo. It can be proved by looking at each drum while the vertiginous patient attempts to inflate his ears, and noting that one or both fail to expand. The disturbance caused by Eustachian inefficiency is better known to those who are familiar with the effect of passing through sudden changes of atmospheric pressure, as in a caisson. Divers know to their anguish the pain in the ears caused by entering the compression chamber with a cold in the head, which prevents equalization of pressure on the drums; giddiness, staggering, or vomiting may occur. High-flying airmen who return from atmospheric pressures of 360 mm. Hg on the drums of the ears know the necessity of 'clearing' the ears by some procedure, such as 'frequent swallowing' or by self-inflation by Valsalva's method. The Eustachian tubes are normally closed, except during the act of swallowing, when they should open for the fraction of a second and close again like the shutter of a camera. It is when the tubes fail to open, through some inefficiency, such as is produced by congestion or swelling of the mucous membrane due to a cold or catarrh, or when blocked by tenacious mucus or by temporary engorgement of the blood-vessels which supply the pharyngeal end of the tube, that the regulating action fails. A too tight collar in some is known to produce the same result.

TREATMENT.—What, then is the treatment for the great majority of cases of so-called Ménière's disease? Having scientifically excluded other factors, the treatment is directed to the Eustachian tubes. Continue to treat local catarrh and remove cause, and train patient to keep his Eustachian tubes free.

The treatment of vertigo by Adrenalin is advocated by Maurice Vernet.³ All vertiginous sensations are essentially of labyrinthine origin. These may have a vasomotor or toxic beginning, and therefore be dependent upon disorders of the sympathetic or endocrine system. For these reasons it seemed logical to try adrenalin, which is a hormone of the chromaffin system, in the treatment of this symptom.

The retina often reflects certain constitutional diatheses; it is therefore more than probable that the labyrinthine membrane may show similar reactions. Lermoyez has shown that spasm of the vestibular or cochlear artery (auricular claudication) may be followed by vertigo, deafness, and tinnitus aurium. Vertigo may also complicate such disorders as the menopause, chlorosis, Graves' disease, and gout. The author concludes with the assumption that vertigo is the subjective expression of a vasotonic disequilibrium of the labyrinthine sympathetic, for which adrenalin would appear to be the best remedy. It has three properties—it is a regulator of blood-pressure; it is antitoxic; and it is excitatory of the terminations of the sympathetic system. The dose recommended is from 5 to 20 drops of a 1-1000 solution given twice daily.

REFERENCES.—¹*Lancet*, 1920, ii, 245; ²*Ibid.* i, 535; ³*Presse méd.* 1920, July 10, 463.

VISCEROPTOSIS. (See COLON, MOBILE.)

VOLVULUS OF THE STOMACH. (See STOMACH, SURGERY OF.)

VOMITING IN INFANTS. (See INFANTILE DIARRHŒA AND VOMITING.)

VULVA, DISEASES OF.

W. E. Fothingill, M.D.

'*Kraurosis*' of the Vulva.—Bérard and Dunet¹ write on this subject, and report two cases in women, age 61 and 64 respectively. These cases were both treated by excision of the vulva, which was in each case the site of a cancerous growth. Most surgeons would no doubt have called these cases cancer of the vulva; but the authors describe one as an example of Breisky's leukoplakic kraurosis and the other as one of Lawson Tait's inflammatory kraurosis, the epitheliomatous growth being considered as a secondary rather than as a primary feature of each case. They regard the causation of these conditions as a combination of ovarian insufficiency and infection; syphilis, tuberculosis, and chronic intoxication being also mentioned as etiological factors. They state that cancerous growths follow all the varieties of kraurosis, and on this ground urge the use of operative treatment in all cases.

[It is useless to read or write about the post-menopause changes in the vulva unless the mind is clear on certain points, which are as follows. Lawson Tait wrote well on the subject about the year 1875; he did not use the terms kraurosis or leukoplakia, but called the condition 'vascular degeneration of the nymphæ'. In Germany Breisky wrote on the same subject in 1885 under the name 'kraurosis', not 'leukoplakia'. The earlier French writers used the term 'leukoplakia' and not 'kraurosis' (see Jayle's important paper of 1906). Next, there are three clinical entities, each with its own characteristic pathology, which can occur separately, any two together, or all three together: (1) The common one consists in red speckles and patches, generally accompanied by urethral caruncle (name suggested is 'caruncular degeneration'); the leading symptom is dysuria, and the best treatment is the cautery. (2) The next in frequency is *leukoplakia*, white discoloration of the skin. This is frequently associated with cancer (10 per cent of cases), which sometimes follows and sometimes precedes the leukoplakia: the leading symptom is itching. Radiation and other forms of treatment are unsatisfactory. Excision (superficial) should be delayed until extension of the affected area has ceased, and is not often required. Excision of the whole vulva is done when cancerous change is present. (3) The rarest change is *kraurosis*, which means, simply, shrinking in size of the vulva and vaginal outlet. This causes no symptoms in the unmarried, and dyspareunia is the only symptom in married women—no itching, no dysuria. Senile vulvitis is of course superadded to any of these three conditions, or to any combination of them, if septic or venereal infection occurs. In German literature the word kraurosis, and in French the word leukoplakia, is used for all combinations of the above three conditions. If these points are kept in mind, the literature of the subject can be understood and cases can be dealt with *secundum artem*.—W. E. F.]

Syphiloma Vulvæ.—A. Stein² revises his former opinion on those slowly-progressive indurated tumours of the vulva, causing no pain and giving rise to inconvenience only through their cumbersome size, which have received various names, such as esthiomène, elephantiasis vulvæ, and lupus vulvæ. He now considers it proved that these are tertiary manifestations of syphilis, which in no way lend themselves to confusion with the primary lesion. The present paper is full of information—literary, clinical, and pathological—on

this subject, which has hitherto been obscure and confused by the use of varied nomenclature. The author concludes as follows:—

1. In conformity with modern knowledge and in the interest of a better understanding of the disease, all misleading names such as *esthiomène* or *lupus vulvæ* should be exterminated from the literature.

2. Syphiloma vulvæ correctly designates the disease as a manifestation of tertiary lues.

3. A positive Wassermann test is not essential in view of the long-standing character of the specific infection in the majority of the cases.

4. The treatment under all circumstances should consist of (1) operative removal of all tumours, hypertrophied tissues, and ulcers; followed in the same session by (2) energetic cauterization; and combined with (3) intensive antisyphilitic medication.

REFERENCES.—¹*Ann. de Gynéc. et d'Obst.* 1919, lxxii, 449: ²*Surg. Gynecol. and Obst.* 1920, Sept., 227.

WAR NEPHRITIS. (*See NEPHRITIS.*)

WARTS, PLANTAR. (*See also SKIN, GENERAL THERAPEUTICS OF.*)

E. Graham Little, M.D., F.R.C.P.

Hazen and Eichenlaub¹ report results on X-ray Treatment in 16 cases of plantar warts. The table appended summarizes the cases and treatment. In all the *x* rays were unfiltered:—

Case No.	No. of Warts	No. of Treatments	Total Holzknecht Skin Units	Result
1	1	3	4	Cured
2	1	2	2½	Cured
3	4	3	4	Cured
4	5	7	9	Not benefited*
5	1	3	4	Cured
6	1	2	2½	Cured
7	1	4	5½	Cured
8	1	3	4	Cured
9	6	3	4	Cured
10	1	1	1½	Cured
11	1	2	2½	Cured
12	1	2	4	Cured
13	4	4	5½	Cured
14	1	7	9	Cured†
15	20	3	4	Cured
16	1	2	2½	Cured

* In Case 4 there were flat warts, a variety notorious for its resistance to Röntgen-ray treatment, no matter where located.

† The patient in Case 14 discontinued treatment before being cured, and then had a recurrence which required a second course of treatments, thus accounting for the large number of units required.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1920, May 8, 1311.

WHOOPIING-COUGH.

Frederick Langmead, M.D., F.R.C.P.

TREATMENT.—Yet another drug has been recommended for the treatment of whooping-cough. David I. Macht¹ has studied the effect of **Benzyl Benzoate** in about 115 cases. A few of these were of adults, but the majority were of children ranging in ages from a few weeks to fourteen years. All were characterized by whooping, and in many the paroxysms were accompanied by vomiting and small hæmorrhages. Most of the patients had already been treated by the usual drugs without benefit, and a number had received vaccine treatment, its effects being also not at all striking. All other medication was discontinued, and the patients were given a 20 per cent solution of benzyl benzoate by the mouth, the dosage varying from 5 to 40 drops in water, three

or four times a day or oftener, according to the age of the patient and the severity of the disease. In cases in which the simple alcoholic solution of benzy l benzoate was found to be too distasteful to the young patients, it was flavoured with a few drops of benzaldehyde, and the medicine was administered in syrup or milk. The addition of a little benzaldehyde, in amounts varying from 1 to 5 per cent, produced a mixture which seemed to act more effectively than benzyl benzoate alone.

About 90 per cent of the patients were benefited, and about 50 per cent exhibited marked improvement in the symptoms. The therapeutic effects were not of a curative character, but were distinctly palliative in nature. These effects were manifested by a reduction in the violence or the number of the paroxysms, or both; and also by the elimination of certain untoward complications of the cough, such as vomiting, subconjunctival hæmorrhages, lack of sleep, and emaciation. In many cases the author interchanged or alternated the benzyl treatment with bromides, antipyrin, quinine, belladonna, paregoric, or heroin, and the difference in the therapeutic effect could readily be noticed.

The mode of action of the drug was examined experimentally, and it appeared to be complex and made up of the following factors: (1) An antispasmodic effect on the bronchial muscle; (2) A sedative effect also on laryngeal muscle, though to a less extent; (3) An anæsthetic action on the larynx; (4) An expectorant action; (5) A sedative action on the respiratory centre; and lastly (6) Possibly an antiseptic action. In view of the low toxicity of benzyl benzoate and benzaldehyde, and the considerable number of successful therapeutic results obtained with them, their further trial in the symptomatic treatment of paroxysmal cough, and especially of whooping-cough, is advisable.

Audrain, Weill, and Dufort have employed injections of *Ether*, and Deheridon² reports 30 cases treated according to Dufort's technique. It consists in the administration of 1 c.c. in twenty-four hours for children under one year, and 2 c.c. in the same time for older children. This is injected into the buttocks for three days in succession, followed, after a day's intermission, by a final injection. There were 5 failures in the 30 cases, but benefit, as judged by the number of paroxysms, is recorded of the others. In one case a boy, age 5 years, had had for fifteen days paroxysms at the rate of 13 in twenty-four hours; he received six injections of 2 c.c. each, and in eight days was free from paroxysms. Another child, age 3 years, who had whooped for nine days at the rate of ten paroxysms per day, received four injections of 2 c.c. each. In six days the paroxysms ceased, but there was a relapse seven days later of a milder type, which yielded in four days to three injections. One patient with complicating bronchopneumonia also notably improved.

Audrain³ gives similar amounts on alternate days; he has always found the ether treatment successful except when adenoids are a factor in causing the spasmodic cough. He ascribes its action to its antiseptic properties.

REFERENCES.—¹*Johns Hop. Hosp. Rep.* 1920, July, 236; ²*Jour. de Sci. méd. de Lille*, 1920, May 30, 22 (abstr. in *Med. Record*, 1920, Aug. 28, 359); ³*Bull. Soc. méd. Hôp.* 1920, June 11, 795 (abstr. in *Jour. Amer. Med. Assoc.* 1920, Aug. 28, 637).

WOUNDS, TREATMENT OF.

Valuable properties are claimed by Churchman for *Gentian Violet* (*p.* 11).

X DISEASE. (See POLIO-ENCEPHALOMYELITIS, ACUTE.)

XERODERMA PIGMENTOSUM WITH BENIGN CYSTIC EPITHELIOMA. (See EPITHELIOMA.)

YAWS.

Sir Leonard Rogers, M.D., F.R.S.

H. Goodman¹ publishes a good clinical account of yaws, and discusses at length its relationship to syphilis, agreeing with the general opinion that the two diseases are quite distinct, as one does not protect against the other, and yaws infection is mainly extragenital and in children. Good photographs of cases illustrate the article. He confirms the good results obtained with **Arsenobenzol** and **Novarsenobillon**. Pierson² considers that early cases of yaws can be cured by a single dose of **Neosalvarsan**.

Arsphenamin advised also on p. 4.

REFERENCES.—¹*Arch. of Dermatol. and Syph.* 1920, July, 7; ²*Med. Record*, 1920, Jan., 94.

YELLOW FEVER.

Sir Leonard Rogers, M.D., F.R.S.

Noguchi¹ has recorded further experimental work on the *Leptospira icteroides* he isolated from cases of yellow fever in Guayaquil. Only 8 out of 74 guinea-pigs inoculated with the blood of yellow-fever patients showed signs of disease, but they were all subsequently found to be immune against injection with large numbers of *L. icteroides*. The serum of patients convalescent from yellow fever gave agglutination with the organism, while the serum of such patients protected guinea-pigs against injections of the leptospira. The organism was also cultivated from the blood of 3 out of 11 yellow-fever patients by the technique Inanda and Ido used for growing *L. icterohæmorrhagiae*, while the organism has also been found in patients' blood by dark-ground illumination in 3 of 37 cases. Stegomyia full of yellow-fever patients' blood occasionally infect guinea-pigs, the insects only taking up 0.01 c.c. of blood, while 0.1 to 0.2 c.c. of yellow-fever blood is required to infect guinea-pigs. Further experiments were carried out to determine if *L. icteroides* can be distinguished from *L. icterohæmorrhagiae* of Weil's disease, or infective jaundice, with interesting results. Monovalent immune serums of each agglutinated the homologous strain more intensely than the heterologous, but distinct cross-agglutination occurred, indicating a very close relationship between the two organisms, which consequently raises the question whether Noguchi's Guayaquil cases were not Weil's disease rather than yellow fever.

C. A. Elliot² records a careful clinical and pathological study of yellow fever as seen in Guayaquil in 1918, and notes that it only differs from infectious jaundice in degree, the jaundice being more marked and the hæmorrhage less in yellow fever. Uræmia was the main cause of death, while convalescence is prompt.

REFERENCES.—¹*Jour. of Exper. Med.* 1919, xxx, 87, 95, 401, and 1920, xxxi, 135, 159; ²*Arch. of Internal Med.* 1920, 174.

APPENDIX.

(Delayed in transit from the United States of America.)

ORTHOPÆDIC SURGERY.

Fred H. Albee, M.D., F.A.C.S.
R. F. Carter, M.D.

FRACTURES.

The Application of Bone-grafting in the Treatment of Fractures.—Hey Groves¹ states that in properly-selected cases the operation of bone-grafting is of unquestionable value. The present tendency is to a too general use of the bone-graft and may discredit the operation. In simple fractures traction and early motion of joints gives good functional results. The tendency toward

the use of sliding inlay grafts (*Fig. 59*) and prolonged fixation of joints in plaster is to be regretted.

[In selected cases the sliding inlay graft is the ideal graft, in that it fulfils the fundamental mechanical, biological, and physiological requirements in this work. In only two bones is it likely to be suitable, viz., the tibia and femur.

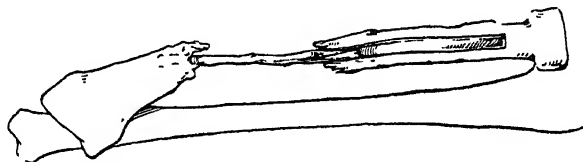


Fig. 59.—Fature of sliding graft applied to gap fracture of the radius.

In all other bones the cortex is not likely to be strong enough, especially when thinned by disease and absence of mechanical stress over a long period of time. —F. H. A.]

In clean, non-comminuted fractures with the line of fracture almost transverse, intramedullary bone-pegs have given good results. Pegs 1 to 2 in. long, $\frac{3}{16}$ to $\frac{1}{2}$ in. in thickness, with a small boss in the centre, are employed.

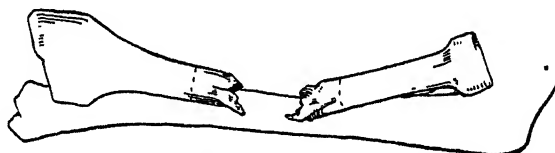


Fig. 60.—Gap fracture of radius with displacement over ulna.

Perforated ox-bone may be used, but autogenous bone-grafts are preferable. [Why a foreign substance, such as ox-bone, should be suggested in the treatment of ununited fractures, the editor fails to comprehend.—F. H. A.]

In cases of non-union, two or more operations are frequently necessary. Pedicle skin-flaps are fashioned to replace the thin cutaneous scars, with removal

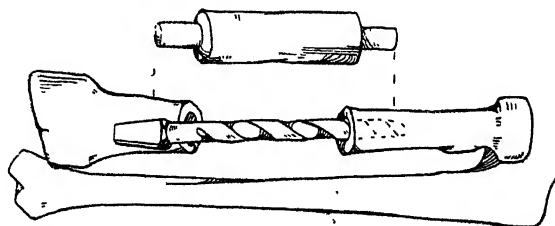


Fig. 61.—Fragments of radius (shown in *Fig. 60*) brought into alignment, both ends being drilled to receive the pegged ends of the graft.

of the deep scar tissue and cleaning up of the bone-ends, followed in from two to six months by bone-grafting. *Figs. 60 to 64* illustrate various methods. [The technique shown in these figures has the disadvantage, from a physiological standpoint, that it destroys largely the marrow substance—active osteogenic and vascular conducting tissue.—F. H. A.]

The Fundamental Laws Underlying the Use of the Bone-graft.—In a paper dealing with this question, F. H. Albee² says that no subject has been discussed more extensively in our recent surgical congresses and clinics than the various uses of the bone-graft. The theories advanced as a result of laboratory researches have been many. The amount of literature which has been written on the subject of pseudarthrosis has been voluminous. Unfortunately, however, for the true solution of this problem, the conclusions offered in many of these discussions and reported experimental findings have been immature, or based upon false premisses, or upon meagre inadequate observations, and the information presented has consequently been misleading. This has been due in part, no doubt, to the exigencies of the times and to the necessity in our military services of calling upon the assistance of men never heretofore interested, perhaps, in this work, or those frequently,

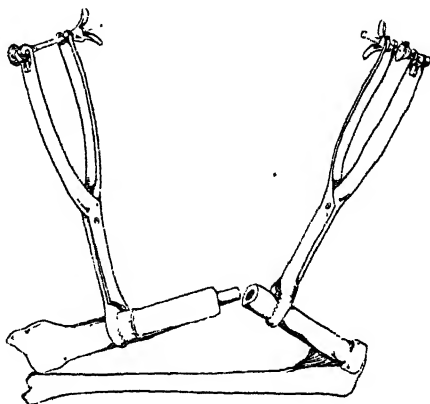


Fig. 62.—Graft seen in Fig. 61 being fitted into its bed by eversion of the fragments.

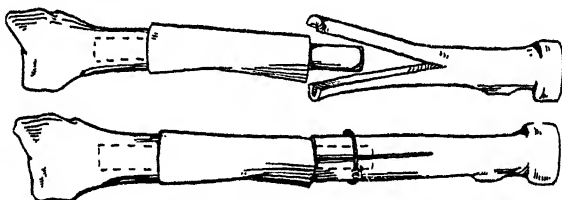


Fig. 63.—Gap fracture of the radius grafted from the tibia, showing one end of the radius split and wired.

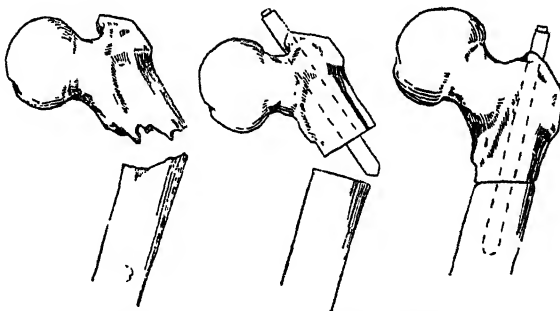


Fig. 64.—Ununited fracture of the upper end of the femur, showing a peg inserted into the upper fragment and driven down into the lower.

alas, unqualified by experience or by mental training and adaptability to do justice to these serious problems. As the necessity for the proper observance

of fundamental biological, physiological, and mechanical laws is more strikingly illustrated in the application of the graft to this condition than any other, the discussion in the paper largely centres around this subject, although it applies equally in the use of the graft for any purpose whatsoever. In concluding a recent report of the large and varied series of cases of pseudarthrosis treated by bone-graft in his military hospital work, the author urges the scrupulous observance of certain essential points in treatment and technique to which he attributes, in large measure, his successful results in this difficult work. The following is a brief résumé :—

1. *Time to operate.*—A careful study of the wound should be made, before it has healed if possible. The type of infecting organism (*Streptococcus hæmolyticus*, gas bacillus, etc.), the nature of the 'clean-up' operation, and the manner of healing of the wound should be noted. These observations have a direct bearing on determining the time when it will be safe to operate. In a few cases it may be permissible to operate after the wound has been completely healed for a period of two months, while in others, on account of possible latent infection where the previous infection has been *Streptococcus hæmolyticus*, etc., it may be advisable to delay the final plastic work for at least six months. In some of the latter unfavourable cases a two-step operative method may be followed, consisting of a preliminary excision of scar tissue with its replacement by a healthy skin-flap, muscle, fat, etc., followed after a period of from ten days to two weeks by the bone plastic.

2. *Immediate pre-operative observation of patient.*—In order to ascertain whether or not latent infection capable of recrudescence exists, splints should be removed, and rough manipulation and deep massage should be given for a period of from one to two weeks before operation. During this time observation of the temperature should be made, and likewise careful examination of the parts for local tenderness or any evidence of recrudescence of infection. The field of operation should be given a forty-eight hour preparation by the tincture-of-iodine technique.

3. *Plan of operation and choice of incision.*—By radiographic and physical examinations, the proposed plan of operation, particularly with reference to location of graft, should be made before actual incision. If it is possible, the skin incision should not be located directly over the intended bed of the graft. The operation must be so planned that the graft may be covered without undue tension of skin, and, if possible, placed so that it may come in contact with healthy tissue instead of scar. In a number of cases in which this was accomplished, the graft healed by primary union; whereas the scar, even at a considerable distance from the graft, broke down entirely. In cases in which there is extensive loss of bone, the scar tissue should be pushed to one side, in order that the graft may come in contact with healthy tissue. Drainage wicks, of any kind, must never be inserted at the time of the operation.

4. *Length of operation.*—The author believes that the shortest possible operating time that is consistent with good work, and with a minimum amount of trauma, is requisite to successful results.

5. *Use of motor-driven tools.*—These are essential, for the following reasons : (a) On account of the necessity for rapid work in order to avoid drying and traumatization of both the graft tissues and the host tissues ; (b) To secure a cabinet-maker fit of parts, thereby providing for early and adequate blood-supply to the graft, for mechanical fixation, and for the operation of Roux's law of frictional irritation, which is a great stimulus to bone growth ; (c) On account of the necessity for the fulfilment of the law of anoci-association. The motor outfit, with its tools to secure automatic fits, seems indispensable in this work. The motor-saw, when properly used, does not heat or glaze

the bone. This has been shown repeatedly by the author in experimentations made formerly, and repeated during the past few months.

6. *Adequate length of graft.*—The bone-graft should always, if possible, be of the inlay type, and of sufficient length to extend into each fragment for a distance of at least 5 cm., and always well beyond the eburnated area at the ends of the fragments (*Fig. 65*). The gutter should extend well into the healthy marrow of the host bone, with which the graft-marrow should be in generous contact. It is important that the marrow in the fragment ends should not be crushed or unduly traumatized, and that the gutter in its substance should

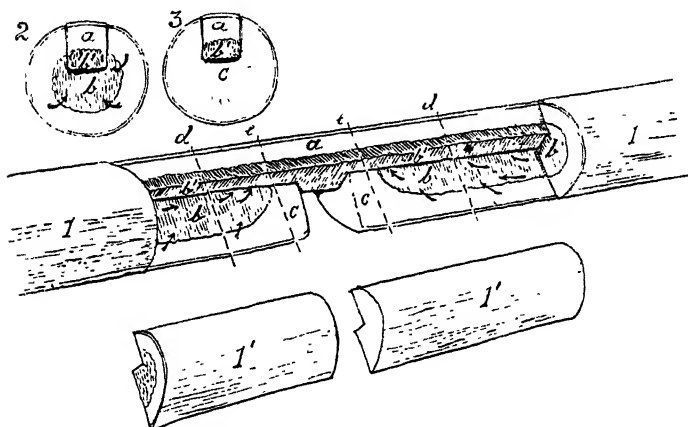


Fig. 65.—Diagrammatic drawing to illustrate the requisite apposition of bone-layers of graft with corresponding parts of host bone, in the bone-graft treatment of pseudo-arthritis, in this case with loss of bone. These proper relationships of graft layers with host layers can be satisfactorily secured only when the graft is inserted by the *inlay technique*.

In this illustration, *a* is the inlay graft inserted in the host fragments, indicated by 1. Portions of the host fragments, indicated by 1', have been schematically removed for the purpose of disclosing the interior structures and relationships.

It is necessary, as shown in this drawing, that the graft be of sufficient length to extend well beyond the eburnated area of the host-fragment ends (indicated by *c*), so that it may come in generous contact with the healthy vascular host marrow, indicated by *b*.

This relationship is further illustrated in 2, a cross-section made at *d*, which shows the inlay graft, *a*, in place, with its marrow, *b'*, in generous contact with the host marrow, *b*. A second cross-section, 3, has been made at *e*, through the eburnated ends of the host fragments, indicated at *c*. This demonstrates the inlay graft, *a*, with its marrow, *b'*, in place in the gutter in the eburnated ends of the host bone, which has been made sufficiently deep to receive the graft. The marrow, as shown in 3, not only serves as an osteogenetic force, but, on account of its continuity from one host fragment to the other, it forms an important vascular and osteogenetic conducting bridge. The arrows in 1 and 2 indicate the direction of blood-supply from the host marrow, *b*, to graft marrow, *b'*.

The cross-sections, 2 and 3, show also the cabinet-maker fit of the inlay graft, *a*, with the host. This not only affords mechanical fixation of the parts, but also favours the stimulation to bone growth from frictional irritation (emphasized by Roentgen) and an early establishment of blood-supply for the graft.

be of proper depth to just receive the graft, so that there will be a close approximation of the marrow of the graft to the marrow of the host fragments, thus favouring the early and profuse anastomosis of blood-vessels between these very vascular tissues. It is also important that a marrow-bridge be formed from the marrow substance of one host fragment to that of the other for the transmission of blood-vessels, bone-cells, etc., across the point of non-union.

7. *Type of graft.*—The graft should, if possible, be autogenous, consisting of all four bone-layers—periosteum, complete thickness of cortex, endosteum, and marrow. It should be so inlaid that the fit is perfect, with an exact

apposition of layers of the graft to the corresponding layers of the host bone. This exact contacting fit favours the mechanical fixation of the fractured bone and the graft; it also permits the frictional stimulus to bone growth, emphasized by Roux, and in every way favours the earliest bony union of graft to host fragments.

8. *Supplemental grafts for additional foci of bone growth.*—Small 'sliver-grafts' placed alongside of the main fixation graft furnish additional foci of bone growth (Fig. 66). They are most efficacious when used in this manner.

9. *The graft as the main fixation agent.*—Fixation should be secured always by the graft itself, and never by metal plates or other foreign material, for the metabolism of the graft and bone growth are directly influenced by the stimulation from the stress carried by the graft.

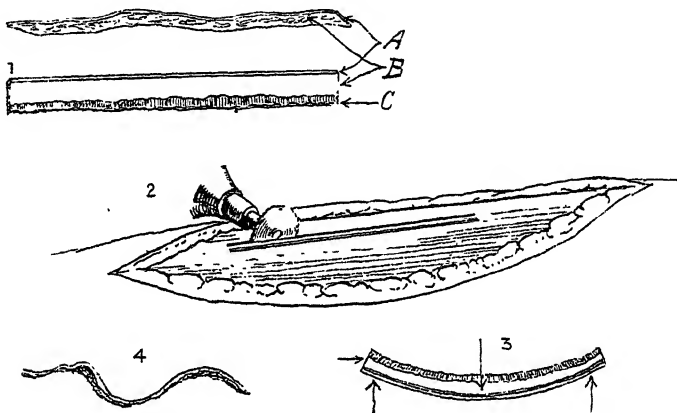


Fig. 66.—In these diagrammatic drawings, 1, 2, 3, and 4 illustrate the fundamental differences in structure and in mechanics between the osteoperiosteal graft, as usually removed by chisel or osteotome, and the author's 'sliver-graft', removed by means of the motor saw, as shown in 2.

In 1, the upper drawing demonstrates the osteoperiosteal graft with its ribbon of periosteum, A, to which are attached plaques of bone-cortex, B. As is evident from this diagram, this graft does not possess the mechanical continuity of a rigid structure; moreover, it entirely lacks endosteum and marrow. In striking contrast to the osteoperiosteal graft is shown the author's 'sliver-graft', the lower figure in 1. This graft is composed of *all four bone-layers*, namely, periosteum, A, compact bone, B, and endosteum and marrow, C. It is a complete bone-unit. Furthermore, it is a rigid structure, without solution of its continuity at any point, and it is thus capable of bearing mechanical stress, and is constantly under that powerful stimulus to bone growth. The arrows in 3 indicate the direction of the mechanical forces which may be brought to bear upon this graft, bending it in a micro-copic or in a macroscopic degree. This illustrates the underlying etiological factor in the stimulus to bone growth afforded by mechanical stress. The impossibility of applying this principle to the osteoperiosteal graft is well demonstrated in 4.

10. *Suture material.*—A minimum amount of absorbable suture material should hold the graft in place. For this purpose kangaroo tendon is the most ideal, since it is tolerant to tissue, readily absorbable, very strong, and reliable. For the skin and the underlying soft parts, fine absorbable suture material should be used.

11. *Post-operative fixation.*—Firm immobilization of the limb by a plaster-of-Paris cast should be maintained for a period of at least ten weeks following operation, and as long thereafter as radiographic examination shows it to be required. Great emphasis should be placed upon the importance of very efficient immediate post-operative fixation, and this can be accomplished only by the most expert management of a suitable fracture orthopædic table (such

as the Albee fracture table) which will allow control of both the upper and lower extremity and skilful plaster-of-Paris technique.

The author is convinced that failures in cases of pseudarthrosis operated by others, where bone-graft was used, were due many times more to inadequate post-operative fixation than to poor operative technique. This statement is especially true in cases with or without loss of bone substance in the upper two-thirds of the humerus, where it is absolutely necessary to immobilize both the elbow- and the shoulder-joints by a plaster-of-Paris shoulder spica, and it was for this type of case more than for any other that the author was induced to devise his fracture orthopædic table.

Attention is again drawn to the importance of using absorbable skin suture material, in order that the plaster dressing need not be disturbed until it is time for the splint to be removed.

Open Treatment of Fractures.—According to I. A. Arnold,³ the open method of treatment is indicated under the following circumstances: When there is considerable displacement of fragments that cannot be otherwise corrected; when complete reduction cannot be secured by manipulation; when manipulation causes undue trauma to other structures; when there are spicules of loose bone and soft tissue between the fragments; when the fragments are rotated upon each other and cannot be maintained in proper position; when the fractures are spiral and multiple; when the fractures involve the nerves or blood-vessels; when the fractures are ununited or in vicious union; when the fractures are complicated by dislocation and in close proximity to joints; in any fracture of the femur when the anatomical position is faulty.

Open operation should be performed for the following reasons: As a rule it ensures better functional results than the closed method; it is more apt to give perfect anatomical position; if bone-grafts are used it secures earlier union.

In bone-grafting only autogenous grafts are used. In the presence of infection, plates should be used. Wiring and nailing have a limited field. Plates should be removed as soon as the bones are sufficiently united to prevent the displacement of the fragments.

Autogenous Bone-grafts in Treatment of Certain Simple Fractures of Bone.—B. Hughes⁴ says that simple fractures such as those near the hip- or shoulder-joint, and spiral fractures of the lower third of the tibia, are best reduced by open operation and the use of autogenous bone-grafts. In order that a bone-graft may grow and function, it must be autogenous and must include periosteum as well as endosteum. A certain amount of movement is beneficial when the graft has begun to unite. [Exception is taken to this statement, especially when the graft is applied for non-union. Motion between the graft- and the host-tissues interferes with a most important desideratum, viz., the early and profuse blood-supply to the graft. In the treatment of fresh fractures this consideration is not so impelling, because of active tissue-proliferation.—F. H. A.] The autogenous bone-graft is far superior to plates and screws in open operation for simple fractures.

Treatment of Fresh and Ununited Fractures of the Femoral Neck.—A combination of the Whitman and Cotton methods of treatment was used by E. Jones⁵ in six cases with very favourable results—the Whitman method of abduction, and the Cotton method of impaction, with a plaster-cast on both legs in extreme abduction. Weight-bearing was not permitted for eight months.

In cases of non-union the use of tibial bone-grafts is often unsuccessful. The head should be removed and arthrodesis of the hip-joint performed. [The editor would qualify this statement in this way: The tibial bone-graft peg, when inserted for non-union of the hip by an efficient technique, offers a large percentage of successes when applied in properly-selected cases. In cases

where the femoral neck has become shortened and the head a mere shell, he aims at a more ideal result than ankylosis. He removes the head and places the end of the neck in the acetabulum after displacing outward the trochanter with its attached muscle. This restores in some degree the ability to abduct the hip, and also prevents its re-dislocation. A fairly movable hip is thus secured.—F. H. A.^{6,7]}

Fractures of the Tibia and Fibula; their Treatment by Plating Operations.—C. F. Strange⁸ gives the histories of fifteen cases of tibial fracture treated by plating. The best results were obtained by operating shortly after the injury; fourteen to twenty-one days was the most desirable period. In cases of long standing it is generally necessary to fracture and mobilize the associated fibular callus.

An incision is made external to the tibial crest. Long plates with three screws to the fragment are used, and are applied to the external surface of the tibia. The plates and screws are kept in boiling water, and the operation is performed without touching the patient with the hands. The incision is closed with clips; no ligatures or sutures are used in the operation. A Thomas splint is applied for several weeks; the limb is then put on a back splint and foot-piece. Usually sufficient callus has formed after three months to permit walking. The plates are used only as a splint to hold the fragments in proper alinement until the new bone forms. [If one has mastered the technique of employing kangaroo tendon as a bone-fixation ligature, and the fracture table, metal plates can be avoided.—F. H. A.]

The Use of Beef-bone Screws in Fractures and Bone Transplantation.—M. S. Henderson⁹ says that one of the most common errors in bone-grafting is poor approximation of the graft to the bone, and it is overcome by the use of bone screws. [The editor is in entire agreement with the first part of this statement—i.e., a common error in this work is a poor approximation of the graft to the host bone. The most efficient way of overcoming this is the skilful and universal use of automatic power-driven tools such as the Albee dowel-shaper and twin saw.—F. H. A.] The screws are well tolerated by the tissues, being absorbed in from six to twelve months. They are brittle, and will stand only a small amount of torsion or strain. [The author is truthful in his admission that the ox-bone pegs are brittle and will withstand only a small amount of strain. This is a most fatal shortcoming, and is all-sufficient to condemn their use. But the further realization that they are nothing more than foreign bodies, and essentially differ little from metal, still further condemns them.—F. H. A.] They are very efficient in maintaining coaptation in spiral and oblique fractures of long bones, fractures of the neck of the femur, olecranon, and certain fractures of the patella; also in fixing bone-grafts in the Albee operation for tuberculosis of the spine, and large grafts in fractures of the long bones. [The use of ox-bone pegs for the purpose herein mentioned necessitates the drilling of the graft to receive the pegs. This is objectionable, in that it weakens the graft, which should always be allowed to retain its full strength.—F. H. A.]

The Plating of Simple Fractures.—F. D. Saner¹⁰ states that simple fractures may be treated by means of accurate splinting or by open operation, preferably the latter. Plates and screws do not often cause after-effects necessitating their removal. To immobilize the limb after the operation a Thomas splint is applied. The dressing is changed on the tenth day; early movement of the limb is practised, with care.

Suggestions for the Treatment of the Radius and Ulna at the Middle Third.—According to C. H. Lemon,¹¹ the treatment must include the fixation of the wrist and elbow, in full supination. Plaster-of-Paris is used for fixation,

reinforced over the point of fracture. After the acute swelling, the arm should be fixed in over-correction, as otherwise outward bowing will take place in the cast. The retentive dressing must not be removed too early. For the first few days coaptation splints should be used, with double padding over the site of fracture to secure over-correction. [Well-applied plaster-of-Paris is the most ideal coaptation splint known, and why not use it from the beginning in such cases?—F. H. A.]

Treatment of Central Luxation of the Femur.—Fractures of the base of the acetabulum with penetration of the femoral head, uncomplicated by extensive fracture of the pelvis, are considered by R. Whitman.¹² This fracture is usually caused by a direct force applied to the trochanter. In the treatment, the practical indication is to assure a sufficient range of abduction. The abduction method used for the fracture of the neck of the femur may be employed, with plaster spica. The spica is retained for several months. An osteotomy below the trochanter is indicated when the resistance is so great that the head cannot be withdrawn by natural leverage. [The editor has had several such cases, and by using his fracture table he has always succeeded in reducing the dislocation satisfactorily when the case has come under treatment during the first few weeks after injury. In old cases where the head cannot be withdrawn from the pelvis, an extensive resection of the rim of the acetabulum and the overgrowth of bone has been done to restore motion, which is blocked by the impingement of the neck and trochanter.—F. H. A.]

• *Causes of Delayed Union and Non-union in Fractures of the Long Bones.*—W. L. Estes, Jr.,¹³ in a study of this subject, says that syphilis may be a cause even with a negative Wassermann, when the manifestations of the disease are present. [Syphilis, in the experience of the editor, plays a very small part in the etiology of non-union. Metal plates, loss of bone substance, infection, failure to reduce fracture, all contribute to non-union more frequently than syphilis.—F. H. A.]

As regards location in delayed union and non-union, the findings are fairly constant. In the humerus, both are confined to the middle third; in the radius and ulna, delayed union was found more often in the distal half; in the ulna, non-union most often in the upper third; in the femur, non-union in the neck, delayed union in the distal third of the shaft; in the tibia, equally distributed over entire shaft, with a tendency to delayed union greatest in the upper third and to non-union in the upper and lower thirds. Fifty per cent of cases of delayed union were due to compound, comminuted fractures. [Non-union at the neck of the femur occurs much more frequently than is supposed. The principal causes of this are, that the fracture is either completely or partially intracapsular; the blood-supply to the capital fragment is poor; the diameter of the central portion of the neck of the femur is relatively small; the mechanical conditions are unfavourable to immobilization, etc.—F. H. A.]

Treatment of Non-union in Compound Fractures.—As a result of his experience in the war, D. P. Willard¹⁴ states that the cases of true non-union were due to infection, or to extensive loss of bone substance caused either by a missile or too radical removal of bone at the primary operation. The treatment is divided into two main parts: restoration of the function of the disabled limb, and treatment of the fracture whenever possible. No operative procedure should be carried out until all sinuses have been closed for six months, and in severe infections nine to twelve months. Heavy massage is given ten days before operation; if any reaction occurs, the operation should be further delayed. At the first operation all the scar tissue is removed; smears are taken from deep tissues. If no reaction occurs, secondary operation may be done in eight to ten days. No metal should be used as a means of fixation

when it is possible to freshen the ends of the bones and obtain good apposition by means of catgut or kangaroo tendon. Autogenous grafts from the same bone, or, better, from a healthy bone, afford the best means of fixation. Many cases of so-called non-union will eventually unite if a good immobilization is continued for a long enough time.

Ununited Fractures of the Hip.—M. S. Henderson¹⁵ draws the following conclusions from a study of 120 cases of ununited fractures of the femoral neck:—

In the majority of cases non-union is due to the fact that the fracture was not recognized at the time of the accident, and therefore was not treated. In other cases, in which the diagnosis was made correctly, the treatment was often faulty and weak. An impacted fracture must be kept impacted until it is united.

Comparatively few of the cases of ununited fractures of the hip are suitable for surgery. [The editor desires to register a very strong objection to this

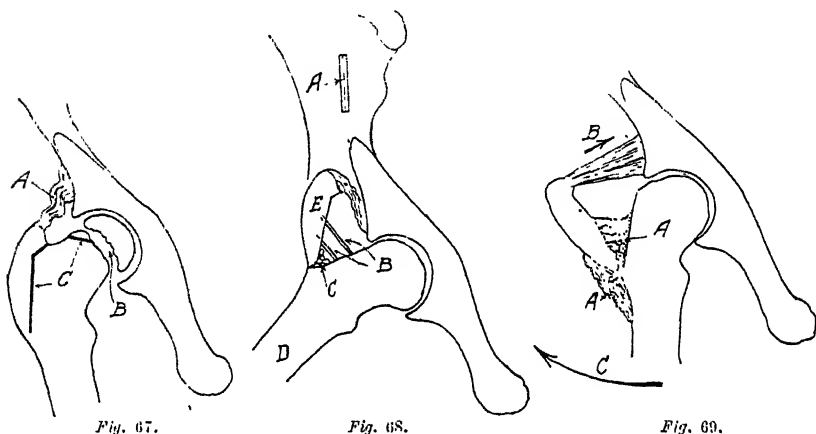


Fig. 67.—A, relaxed abductor muscles due to B, loss of bone substance and shortening of the head and neck of the femur; C, saw cuts to form new head.

Fig. 68.—A, site of removal of sliver grafts from the side of the ilium, which is laid bare by the approach to the hip; B, sliver grafts in place; C, small bone-grafts; D, abduction of shaft of femur; E, reflected fragment of trochanter.

Fig. 69.—A, callus formation uniting fragment of bone in its oblique position; B, arrow indicates the abduction direction in which the muscles at B pull the lower extremity, as indicated by arrow C.

statement. There is no condition so amenable to surgery as this. It is a great pity that so little is known about the treatment of fracture of the neck of the femur—especially ununited fracture.—F. H. A.]

Advanced age, poor general health, etc., are contra-indications to operation; but the chief contra-indication is absorption of the femoral neck. In the case of a patient twenty-five years of age the absorption of the neck of the femur may be so great five months after the accident that no measure will offer any hope of benefit. [Much can be done for just such cases. The editor offers an operative treatment for this condition.^{16 17} It is always preferable to use a bone-graft peg when the capital fragment is long enough and rotates in the acetabulum. In cases where the neck has been much absorbed, the editor removes the head of the femur and places the neck and moulded trochanter in the acetabulum, as shown in the above diagrams (Figs. 67–69).—F. H. A.]

In the suitable cases any means that will freshen the fractured surfaces and hold them in apposition is sufficient. [This statement is most unfortunate. An ununited fracture of the neck of the femur certainly needs something more than just to hold the freshened fractured surfaces together. It is most imperative that the fixation agent should also possess active osteogenesis. The bone-graft peg, when properly inserted, fulfils all requirements.—F. H. A.] For the latter purpose autogenous bone pegs are the most satisfactory.

Bone from the fibula seems to be the best for pegs, as it is easily obtained, and it is never missed if it is removed 4 in. above the external malleolus. [This technique means most inaccurate work, and if ever the old adage of 'placing a square peg in a round hole' is true, it is in this respect. An urgent plea is made for more accurate work, and this cannot be accomplished short of the employment of the power-driven automatic tool.—F. H. A.]

Treatment of Compound Fracture of the Femur.—P. Turner¹⁸ writes on a series of 103 cases treated at a general hospital in France, and describes three periods in the evolution of the treatment of fractures of the femur. The series of 103 cases was treated during the second period from the summer of 1915 to the beginning of 1918, when new methods were brought forth and perfected.

Before admission the treatment consisted in cleansing of the wound, and usually the application of the Thomas splint.

On admission an x-ray examination was made, followed by removal of all loose fragments and foreign bodies, and the application of a Thomas splint or, in a few cases, a suspension Hodgen splint. The mortality was 13.59 per cent. The cause of death is given.

A new method of measuring the degree of shortening in fracture of the femur below the neck is described—measuring from the trochanter to the head of the fibula.

J. J. Moorhead¹⁹ comes to the following conclusions as regards the management of fractures of the femur :—

The treatment of fracture of the femur starts with 'first aid' designed to place the limb at rest in traction in a Thomas splint, or in traction straps with weights attached. Ambulance surgeons and first-aid men should be supplied with Thomas splints. The patient and not the fracture will demand the most attention in the feeble or diseased. Any method that does not combine reduction with early massage and motion fails to give the maximum service.

The former idea that deformity and disability are inevitable in femur fractures should be abandoned. Two attempts at reduction should be made before skeletal traction or open operation is performed.

For the non-displaced and reducible group, plaster-of-Paris, spica or moulded, is an efficient form of splintage. In the irreducible group—all supracondylar forms with typical backward displacement of the lower fragment, all sub-trochanteric forms with much displacement, all fractures of the shaft in very muscular individuals in which there is overlapping of over an inch, and any form (except the neck) in which more than a week has elapsed without correction—skeletal traction by transfixation offers a safe and efficient method. This fracture entitles the patient to a high grade of surgical care, and exacts from the surgeon a degree of diligence and skill at least equal to that necessary in the management of many other major surgical procedures.

Fractures have been too much slighted by surgeons, and for that reason the fracture field is being encroached upon by the orthopedists, who by their training are better fitted for the after-care than for the initial treatment of this acute variety of traumatic surgery. There is great need for standardization and uniformity in fracture work, and in no group is this more necessary than in fractures of the femur.

Schoenmann Clamp.—Fleuster²⁰ states that at the Cologne clinic the adhesive method and the nail-extension method in the treatment of fractures have been superseded by the use of the Schoenmann clamp. The method is simple, and there is no danger of infection. [The experience of the editor does not bear out this statement. On the contrary, there is always danger of infection in these transfixation methods.—F. H. A.]

In cases of fracture of the forearm or leg, double extension above and below is necessary to avoid lateral displacement. After some consolidation has taken place, a circular plaster cast is applied.

Fractures of the Femur from the Orthopædic Point of View.—J. P. Jones²¹ gives detailed directions for the application of calipers to the femur and the subsequent care of the case. The skin should be drawn upward and slightly forward over the condyles. On the outer side the tongs should be placed

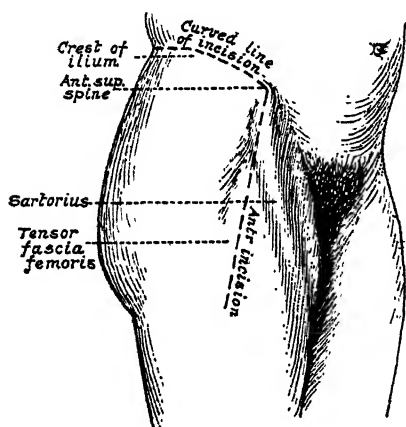


Fig. 70.—Line of incision for subperiosteal approach to the hip-joint.

anterior to the iliotibial band. They should not be placed too far to the front, or they will slip on the sloping surface. On the external surface the point of insertion is just proximal to the most prominent point of the outer condyle, and on the inner surface about a finger-breadth proximal to the adductor tubercle. Ten to fifteen pounds pull is applied. The calipers are left on for from five to seven weeks. In 205 cases the average shortening was 0.48 cm.

DEFORMITIES.

Operative Treatment of Irreducible Paralytic Dislocation of the Hip-joint.—E. Jones²² describes a modification of the Albee operation on dislocated hips when the acetabulum

is shallow and the bloodless method has failed. The superior curved lip of the acetabulum is turned down and held by tibial bone-grafts acting as a

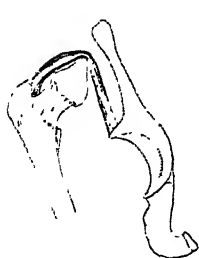


Fig. 71.

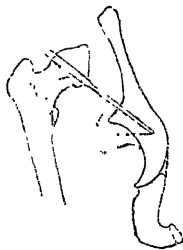


Fig. 72.

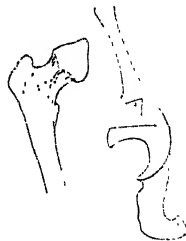


Fig. 73.

Fig. 71.—Schematic drawing of a persistent paralytic dislocation. Note the overstretching of the capsule and trochanteric muscles, the deficient acetabulum, the distorted femoral head. The dotted line indicates the approximate depth of the normal acetabulum.

Fig. 72.—Turning down a superior bony lip to form an efficient acetabular roof.

Fig. 73.—The roof turned down and a notch prepared for the tibial transplant.

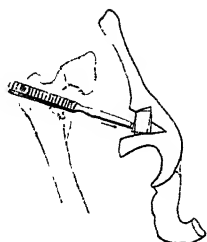


Fig. 71.—The tibial transplant being forced into place. The head of the femur is remoulded.



Fig. 75.—The dislocation reduced and reduction maintained by the now efficient acetabulum (Albee's technique).

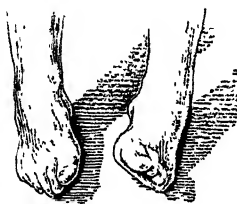


Fig. 76.—The outward rolling exercise. Weight on feet, body steadied by support of chair or table. Roll outward twelve to thirty times, twice daily.



Fig. 77.—Second exercise—up and out—rise on toes and pull heels in.

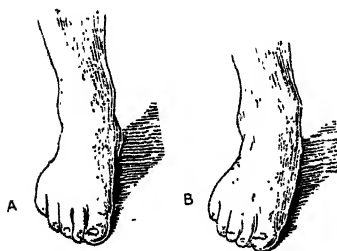


Fig. 78.



Fig. 79.



Fig. 80.

Fig. 78.—(A) The normal balanced foot held in moderate supination. If one can at all convert B to A much has been gained. The semi-involuntary conversion of B to A as a result of special training constitutes the only cure of 'flat-foot' known to the writer. For those inclined to be of faint heart, let us say that this conversion of voluntary into subconscious control of muscle-action takes place a bit more promptly than one would expect.

Fig. 79.—'Toeing-in', a position much frowned on by our teachers and elders, is really an admirable corrective of pronation—awkward as it looks. One cannot toe-in and also pronate. Try it!

Fig. 80.—Outside support with ankle-joint and T-strap to limit pronation.

wedge in the space left by turning down the rim of the acetabulum, forming an efficient acetabular roof (Figs. 70-75). He arrives at the following conclusions :—

Correction of the [deformity with function in certain cases of so-called irreducible paralytic dislocation of the hips can be obtained. Hoffa's belief,

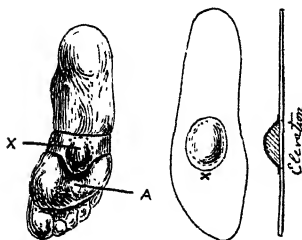


Fig. 81.

Fig. 82.

Fig. 81.—'Morton cuff' with pad in the pocket at X. The callus uniformly present in 'anterior arch' cases is to be found at A.

Fig. 82.—Pad on insole, for anterior arch trouble. X shows position of central callus, from which pressure is diverted by the pad.

based on experiments on the cadaver, that rupture of blood-vessels and nerves must occur in long-standing cases before surgical shortening can be overcome, does not hold true in the living. Muscles in paralytic hips which by their contractions are able to perpetuate a dislocation of the hip are also able to perform function if the dislocation can be reduced. Therefore arthrodesis should not be the method of choice except in cases of flail hips.

Flat-foot and other Static Foot Troubles.—

F. J. Cotton²³ divides these affections into five classes for discussion :—

1. *Flat-foot* (habitual; rigid; bony).—No real deformity, merely a position of relaxation and pronation. A physiological disorder. Muscles concerned are: tibialis anticus, flexor longus hallucis, and flexor longus

digitorum. Treated along physiological lines (Figs. 76-80).

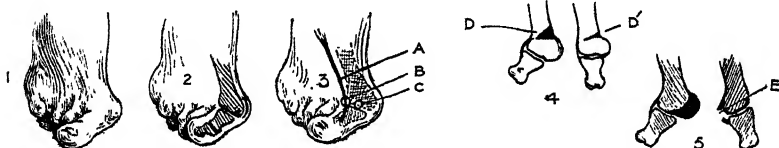


Fig. 83.—(1) Hallux valgus. (2) Hallux valgus: bones. Note hypertrophy of metatarsal head—obliquely. Note, also, the 'bunion' bursa. (3) A, Extensor proprius hallucis. Note outward pull of the displaced tendon; B, C, are the sesamoids, displaced outward, more or less, with the flexor tendon. (4) Cuneiform osteotomy: D, the wedge to be removed; D' correction after removal of the wedge. (5) Plastic operation: Portion in black is resected. At E the external ligament is divided, permitting real correction of the deformity.

2. *Short heel cord*.—Especially in women from wearing high heels. The tendon can usually be stretched in one or two sittings with Davis wrench without the use of an anæsthetic.

3. *Contracted foot*.—Spastic type, and nearly always congenital.

4. *Anterior arch trouble* (Morton's disease; 'fallen arch').—Metatarsalgia usual. Common type is that of a tender central callus with most of the weight carried by 2nd and 3rd metatarsal heads (Figs. 81, 82).

5. *Hallus valgus and rigidus* (Figs. 83, 84).

Treatment of Weak or Flat Feet: New Combination Foot Support.—Weak or fallen arches are due to ligamentous strain after weakening of the muscles of the foot. J. Carling²⁴ describes the following treatment: Properly-fitting shoes,

arch support consisting of full-length flexible inner sole, having on its under surface two compartments to be filled with felt or other material to raise the

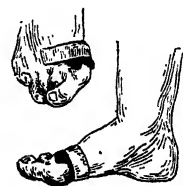


Fig. 84.—Proper bunion pads of felt.

longitudinal and transverse arches, a supinating wedge of leather attached to the under surface to raise the inner border of the foot, and a light steel spring underneath the supinating wedge which serves as a counter-support to the longitudinal arch, and by strengthening the shank of the shoe maintains the efficiency of the support.

Congenital Foot Deformities.—S. Peltesso²⁵ says that spina bifida occulta associated with congenital foot deformities, and especially club-foot, is much more common than has been believed. In cases of both acquired and congenital foot deformities in which the etiology is doubtful, the demonstration of a spina bifida occulta by means of *x* rays may be the deciding factor. From investigation the impression was gained that this condition was present in the majority of club-foot deformities. [It is well known that one congenital bone deformity of any kind is liable to be associated with another which may be very remote from the first one.—F. H. A.]

Cause of Growth Deformities.—From the study of late rickets, A. Fromme²⁶ considers that the primary cause is to be found in a pathologic change of the bones. Deformities are induced by a rapid increase in the body-weight which is too great for the weight-bearing capacity of the bones, especially those of the lower extremity. The deformities occur most commonly during adolescence. The growing zone is seriously influenced by trauma, and an injury and resulting deformity of one side causes deformities in the opposite. Osteochondritis and the formation of joint bodies during the growing period may also be explained by this theory.

Weakened Foot: its Measurement and Correction.—According to C. P. Huthins,²⁷ weakened foot results from increased body-weight or weakness of the foot muscles which have been overstretched by malposition of the various bones, improper shoes, or improper walking. The estimation of the deformity must be made from the active foot. For this the 'rotameter' is used, an instrument the chief feature of which is a platform to be placed under the feet, each half of which can be tilted until the external promontory of the tubercle of the os calcis lies anteroposteriorly to the lower border of the external surface of the trochlea of the talus. A solid post carrying an adjustable cross-arm at the level of the inner surface of the talus stands midway between the inner malleoli to arrest the rotation. With the feet thus exactly corrected, and the ball snugly secured by a transverse strap, a mould of the foot is made.

[For purposes of record such instruments have a certain minor value. From a clinical standpoint nothing will take the place of a thorough examination of the foot and leg by one experienced in such cases. In a given severity of weak foot the arch may be low or average in height. The condition of the heel cord, whether shortened or not, or whether the attached muscles are sensitive to over-stretching, the degree of flexibility or rigidity of the midtarsal region of the foot, the history, etc., are of much more importance clinically than mathematical measurements.—F. H. A.]

Neo-arthrodes, especially of the Knee-joint.—Bier²⁸ states that the feasibility of any operative method for the formation of a neo-arthrodesis is best tested in the knee-joint. [This opinion is quite at variance with most authorities. The knee has been found to be the most unfavourable of all joints for arthroplasty to mobilize ankylosis.—F. H. A.] Helferich's method is very complicated in the knee- and foot-joints, and the danger of infection is great. The results obtained after more simple methods of injection of blood, serum, salt solution, and sterilized gelatin are not at all constant or certain. After-treatment should consist of flexion for from ten to fourteen days, extension three or four days, and then flexion during the night and extension during the day, followed by active motion. The patient should be allowed up after four to six weeks,

with or without the application of Scharnier apparatus. Very old ankylosis is no contra-indication to operation.

Treatment of Pseudarthrosis of the Leg.—In a series of 139 cases of pseudarthrosis, C. Dujarier describes 24 cases of involvement of the leg. Three were closed fractures with no loss of substance. The average loss of substance was 5 to 6 cm. Treatment without loss of substance consists of reduction with leverage and coaptation of fragments; no metal plates are used. With extensive loss of substance, treatment is by grafting. In 12 cases grafting was done according to Albee's technique, the graft being taken from the vicinity generally. No suppuration occurred. Consolidation resulted in all except one case; fracture of the graft took place in 3 cases five to six months later, with consolidation by continued treatment. Of 12 cases treated by Albee's method, complete consolidation occurred in 10; of 6 cases treated by other methods, consolidation resulted in 5, with suppuration in 1. Of 24 cases, consolidation was obtained in 20; 2 suppurated and 2 are still under treatment. Consolidation occurred in two to four months.

Treatment of Pseudarthrosis of the Neck of the Femur by Albee's Method.—In the opinion of A. M. Bastos, the use of bone-grafts obtained from the same patient is more rational than the use of ligatures, screws, or spikes of ivory or other materials. The following points in the operation are of special value: (1) Placing the leg previously in internal rotation and maximal abduction, so that apposition of the fragments may be obtained most easily. [Unless the head of the femur rotates freely in the acetabulum, a posture of too much abduction at the time of the operation may endanger the bone-graft when the plaster-of-Paris spica is removed and the weight of the limb comes upon the graft too early before firm consolidation has occurred.—F. H. A.] As a rule a plaster cast should be applied afterwards to sustain the parts in this position. (2) Inserting the graft exactly in the edge of the neck, low down at the superior edge of the diaphysis, and directing it obliquely toward the centre of the head or somewhat higher. [Too great emphasis cannot be placed upon the importance of excising all connective tissue from between the fracture fragments. The joint capsule is often curled in between the fractured bone ends, and must likewise be entirely removed. The bone ends must be thoroughly freshened by means of a chisel and curette.—F. H. A.]

The Interpretation of Muscle Function in its Relation to Injuries of the Peripheral Nerves.—In a study of this subject by C. C. Coleman,²⁹ the cycle of disturbed function, ranging from great enfeeblement or total paralysis to complete return of muscle action, was noted during the period of observation. Months of intelligent effort on the part of the patient had developed replacement of function by the substitutionary muscles to a confusing degree in many cases. The larger number of substitutionary movements in patients with peripheral nerve injuries were found in the muscles of the upper extremity, and particularly in the intrinsic muscles of the hand. Some uncommon substitutionary movements were noticed. In one case with complete paralysis of the deltoid, the arm could be raised above the level of the shoulder principally by the supraspinatus and trapezius with the other fixation muscles of the shoulder. Accurate and efficient flexion of the forearm was noted by the brachioradialis alone. In one case with paralysis of the musculocutaneous and musculospiral, considerable flexion of the elbow was accomplished by the development of substitutionary pronator action. Extension of the arm was not involved in substitutionary movements, nor was pronation. In flexion of the wrist with median and ulnar supply lost, substitutionary flexion was performed by the extensor ossis metacarpi pollicis through the musculospiral, this being detected by the hyperextension that occurred. The requirement

for dorsal elevation of the hand in musculospiral lesions above the elbow was a slight shortening of the extensor tendons unless a considerable degree of hypotonia existed; the army splint for complete musculospiral paralysis accomplished this. In moving the thumb across the palm by the action of the opponens and flexor brevis with the extensor pollicis paralyzed, extension may occur by the same mechanism as elevation of the hand in musculospiral paralysis by making a fist—the action of all the interossei, including the adductor of the thumb supplied by the ulnar. Forcible flexion of the phalanges by the flexor profundus acting alone, if continued, produced flexion of the second, and finally the first, phalanges. By supporting the first phalanges of ring and little finger in a patient with ulnar griffe, complete extension of the fingers may take place. In combined median and ulnar lesions, moderate flexion of the fingers by extension of the wrist took place; even with median injury the first finger could be flexed by extension of the wrist. Extension

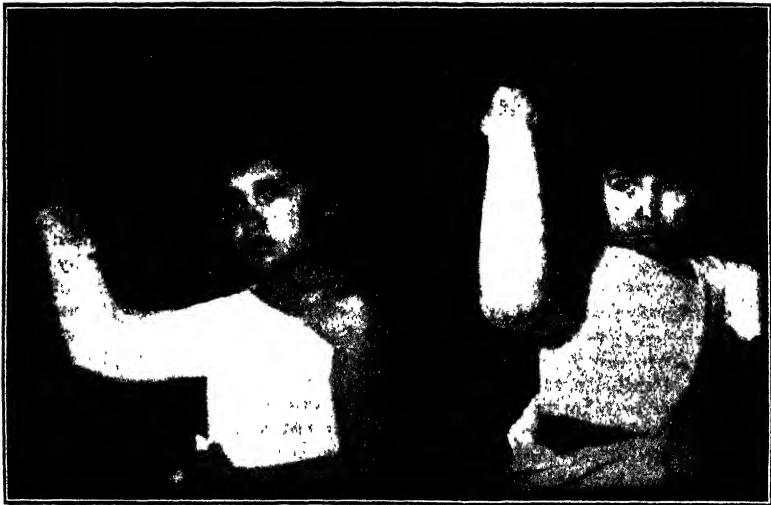


Fig. 85.—Plaster shoulder spica for brachial birth paralysis.

of the fingers in musculospiral paralysis took place by supporting the primary phalanges. The common extensors were capable of spreading the fingers in accurate imitation of the interossei. Contraction of the long flexors caused adduction of the fingers. No case of sciatic paralysis showed inability to flex the knee because of the nerve lesion. Substitutions were not frequent in the lower extremity, except of the ankle-joint, where muscles of the first order were involved.

Brachial Birth Palsy and Injuries of Similar Type in Adults.—A. S. Taylor³⁰ says that the percentage of spontaneous recoveries in brachial birth palsies is very small, and will occur in three weeks if at all. Birth palsy is due to nerve injury, varying from stretching of brachial nerves to tearing or avulsion of the roots. The treatment recommended is early operation, consisting of exposure and suture of the torn nerves, with the arm put up in external rotation and abduction, and fixation of the head; fixation is to be continued for three months. The figures of the author are 70 cases, with 3 deaths. Result.

marked improvement in infants; in adults (14 cases), improvement, but less than in infants.

[In cases which do not respond to nerve suture, or in old cases where firm contractures of all the soft structures about the shoulder have occurred, thus holding the extremity rotated inward so that the hand cannot be brought readily to the hair or face, the editor has secured excellent results by doing an osteotomy of the humerus just below the insertion of the deltoid, and rotating the loose humeral fragment outward upon the upper fragment about one-half of a circumference. The post-operative fixture consists of a plaster-of-Paris shoulder spica put on with the aid of the Albee fracture-orthopædic table. The same posture is employed following an arthrodesis operation on the shoulder-joint. Fig. 85 demonstrates both the splint and the posture.—F. H. A.]

MISCELLANEOUS AFFECTIONS OF BONES AND JOINTS.

Osteomyelitis from the Standpoint of the Clinician.—A. J. Ochsner and D. W. Crile³¹ sum up their conclusions as follows:—

An early concise diagnosis and immediate surgical treatment are of greatest importance.

The operation should invariably consist in splitting the periosteum for a distance of 2 to 5 cm. beyond the area of pain upon pressure on the bone in each direction. The periosteum should be loosened from the bone for a distance of 1 to 2 cm. on each side of the incision. In extremely severe cases this should be the extent of the primary operation.

In less severe cases ultimate healing can be hastened by carefully opening the medullary canal at the point previously located because of pain upon pressure. Care should be employed to prevent traumatizing tissue by rough chiselling. [This expression of caution is well taken. The editor in such cases goes still further and does not use the chisel and mallet at all. By means of his electric bone-engine the cortex is drilled with a large burr. If pus is found, the Albee twin saw is then adjusted the proper distance apart for the particular bone. Parallel cuts through to the marrow are then made for a distance of about one inch up and down from the drill-hole. The strip of bone thus formed is then cut off with the small motor cross-cut saw. This is repeated until the limit of the suppurating marrow canal is exposed. This divides the operating time by about ten, and avoids the jar from the impact of a chisel and mallet.—F. H. A.]

Moist hot antiseptic dressings with fixation of the extremity and use of electric-light treatment increase comfort and facilitate healing. The shaft of a long bone should never be removed until a good involucrum has formed. In late cases, or in secondary operations upon cases treated as above in the acute stage, every particle of dead tissue must be removed.

At this same operation some definite plan must be carried out to facilitate closing the defect. Skin-grafting is of great value in many cases. Local foci of infection, such as diseased tonsils or teeth or sinuses, should invariably be eliminated at once upon undertaking the treatment of patients suffering from osteomyelitis.

Infections of Bones and Joints.—F. J. Cotton³² says that war routine cannot be followed in civil life, but we have learned that wider cleaning out and drainage than used to be the case is a first essential both for limiting infections and for later disinfection, and that disinfection is possible. The ultraradical primary débridement as a rule avoids secondary laying open—a wide-open exposure and a strict conservation of bone (rarely removing it in the presence of active infection) being sufficient.

The greatest use of the splints developed and popularized by army use is in transportation and early acute cases, leaving the problem of external fixation about where it was before the war, except for the aeroplane splint and the 'cock-up' wrist splints, cases in civil life deserving more individual application of bone control.

The question of direct fixation in the wound is still debated; it is to be avoided when it can. There is no objection to holding fragments against wide separation with a suture or perforated plate. Plates of Lane type are out of place in an infected wound, and are undesirable in a clean one.

Treatment of non-union and of bone loss following compound fractures is made difficult by the enormous scars, especially in war wounds. Serious need exists for a way for determining repair—real bone repair; salvarsan, thyroid, and lime do not solve the working problem. It is met by waiting with some success, and by bone-grafts—which are not always successful—as a starting-point for bone growth. Magnesium to stimulate bone-formation, and the local injection of lime salts, are both being used experimentally.

The 'ideal' operation for osteomyelitis of hæmatogenous type—if there is an ideal—is the abortive treatment rather than the late subperiosteal resection.

Treatment is summarized as follows:—

1. Before there is bone damage: Open the focus of infection.
2. When bone damage is small: Early operation, trephining, drainage, and disinfection, with late removal of sequestra. [See second editorial note on p. 532.—F. H. A.]
3. With a good deal of bone destruction: Establish good drainage and disinfection, and wait until demarcation occurs; then remove sequestra; continuing disinfection, the wound will heal.
4. With total sequestra, whatever length: Wait until x ray shows periosteal shadow-line of new bone; then do subperiosteal resection.
5. Cases first seen in late stage with involucrum enclosing sequestra: Open the shell by making a trough, and remove the sequestra with the pyogenic membrane. The ideal operation for filling up the trough is removing the sides of the trough, leaving only the bottom and such lateral periosteum as may be separable, with adequate support of bone afterwards by splinting.
6. Late cases with many poorly-draining fistulæ: Removal of the sequestra, open trough drainage and open cleaning of sinuses, disinfection, and then a second operation to start repair.
7. Late cases with open drainage and poor reparative processes: Good results from use of bone-wax as a temporary filling, after disinfection with carbolic following a thorough cleaning. In cases with lack of repair power, bone-grafts are out of place, either because the wounds are septic or because they are so liable to recurring sepsis; whole plastics are useless except in the cross-transplants of fibula for tibial defect. [This statement is very surprising. This pessimism can be founded upon no other premiss than lack of experience.—F. H. A.]

Acute Osteomyelitis and Periostitis Complicating Epidemic Influenza.—M. Behrend³³ reports five cases, the radius being removed in one case; he also gives a review of the literature of excision of the radius. In acute osteomyelitis, the sooner the medullary canal is opened the better will be the ultimate functional result. The only safe procedure is the removal of the entire roof of the bone. The period of onset varies, the manifestations appearing weeks after the acute symptoms have subsided. In two cases an interval of five weeks elapsed.

Immediate Sterilization and Closure of Chronic Infected Wounds of Bones and Soft Tissue.—W. W. Babcock³⁴ observes that to prevent the entrance of zinc

chloride into the general circulation when force is used to inject sinuses of the extremities, a tourniquet is applied above the sinus, that the zinc chloride may be neutralized before reaching important organs. If the sinus is so located that the tourniquet cannot be applied, the cavity is packed with cotton pledgets moistened with the solution. The author's method of treatment comprises: Immediate chemical sterilization of all sinuses and wound surfaces by the injection and application of a saturated solution of zinc chloride; delineation of infected areas by injection of an ethereal solution of methylene blue; mass excision of the entire area of the infection: closure of wound with the obliteration of all dead spaces; all carried out in one operation. From 70 to 94 per cent of chronic bone sinuses can be closed successfully by the method described. [In a considerable number of cases done at the U.S.A. General Hospital No. 3, at Colonia, New Jersey, there were no fatalities. The percentage of successes was only about 50 per cent.—F. H. A.]

Septic Bone Infection, with Special Attention to Osteogenesis in Sepsis.—E. A. Rich³⁵ states that the periosteum and more especially the cancellous bone with its endosteum are the important structures that must be conserved in both acute and chronic types of bone infection. In acute cases the shaft is opened as wide as the medullary cavity for four-fifths of its length. It is not curetted; it is left open and irrigated with sterile water. Regeneration is complete in three to four weeks. In chronic osteomyelitis the medullary canal is laid open, the sequestrum removed, and the cavity obliterated by flaps of the surrounding muscles and fat with attached pedicles.

Treatment of Tuberculosis of the Spine.—H. W. Meyerding³⁶ gives the following particulars. Of 405 patients with Pott's disease observed at the Mayo clinic from September, 1912, to January, 1919, 100 were operated on by a modified Albee bone-grafting method. The average age was twenty-five years; 9 were between one and ten years old. Twenty-two patients gave a history of trauma to the area involved. Twenty-seven had had tuberculosis in other parts of the body. Eighty-six per cent of the patients have been relieved of the clinical symptoms; 3 have been unimproved, 3 not heard from, and 8 died since the operation.

The author summarizes his conclusions as follows:—

The fusion operations of Hibbs and Albee for tuberculosis of the spine have given a means of obtaining internal fixation which shortens recumbency, prevents further deformity, and tends to hasten healing. The disease in the vertebral bodies is not eradicated by the fusion operations, and relief of symptoms does not mean cure. General antituberculous treatment is of primary importance, and should be insisted upon. Recumbency and external fixation are still necessary adjuncts to successful treatment, and should be carefully carried out. Abscesses should be let alone unless they cause discomfort or pain, or are secondarily infected, when they should be carefully aspirated and injected. [The wisdom of injecting a cold abscess is doubtful. Anything which will stimulate the extrusion of exudation from the abscess wall is undesirable. In aspirating, the needle should never be thrust through the thinnest part of the abscess wall, but should travel obliquely through as thick a portion of the wall as can be found.—F. H. A.]

A primary focus, which can be determined in a small number of cases, indicates a general disease of which the spinal symptoms are manifestations. Children under five years of age and adults with active pulmonary lesions and sinuses are poor risks. Paraplegia does not contra-indicate operation for fixation. [Paraplegia and a cold abscess are not contra-indications to operative fixation of the diseased portion of the spine by bone-graft, but, on the contrary, are added indications for this operative treatment.—F. H. A.]

Flail Joints.—Sir R. Jones³⁷ gives the following outline of treatment :—

1. Treat radically all discharging sinuses and osteomyelitis. Fix the joint with its surfaces approximated, as there is a chance of ankylosis, especially in the elbow and shoulder.

2. In the absence of sepsis, fix in the best position for function. Then re-educate the important muscles of the joint.

3. Approximate the joint surfaces and hold with sutures.

4. Attempt to ankylose the joint.

Flail hip : Treatment depends upon the amount of bone lost. If the head and neck are gone, obtain function by the use of calipers and correction of deformities. Bone-grafting to obtain ankylosis is not expedient. [This statement is surprising in that the editor has ankylosed many such cases by means of bone-grafts. The results have been strikingly satisfactory.—F. H. A.] If the trochanter and upper shaft are missing, a sliding bone-graft reaching to the acetabulum will produce ankylosis. Grafts from other parts of the body are not satisfactory. [The editor has also done many such cases using grafts from the tibia. The tibial grafts are as a rule stronger than the sliding graft when the femoral cortex is osteoporotic, and for that reason more desirable.—F. H. A.]

Flail knee : It is best to produce ankylosis by sawing off the bone-ends. If there is too much separation of the bones, use a sliding graft either from tibia or femur.

Flail ankle : Rare. Induce ankylosis or amputate.

Flail shoulder : If the head only is missing, re-education of muscles is preferable to ankylosis. If more bone is missing, employ an autogenous bone-graft.

Flail elbow : Conservative treatment is possible only when the ends of the bones are broad and muscles can be re-educated. Operative treatment may be used to induce ankylosis or to obtain a movable joint. Pseudarthrosis should be attempted when the muscle power is good.

Flail wrist : Rare. Induce ankylosis.

Stiff joints may be caused by fracture in the joint or long immobilization. As regards treatment, gradual flexion of a stiff knee instead of forcible flexion is preferred. If the quadriceps is adherent, loosen adhesions and interpose fat and fascia between it and the bone. When the capsule is scarred and shortened, make a curved incision from the attachment of the internal lateral ligament to the tibial tubercle. In cases of intra-articular adhesions, treat conservatively by gradual flexion. If the patella is adherent to bone by bony adhesions, chisel out and interpose membrane. Complete ankylosis of the knee-joint should be left alone in war surgery unless there is deformity.

In flexion of the knee if it is flexed at thirty degrees, leave alone ; if flexed beyond that angle, do a cuneiform osteotomy and fix at an angle of fifteen or twenty degrees. Lateral deviation of the knee and genu recurvatum should also be treated by osteotomy.

Dislocation of the Shoulder-joint.—A. H. Todd³⁸ says that the usual trouble after treatment of dislocated shoulder in the traditional position, with the arm bandaged to the side, is limitation of abduction, which is due to adhesions around the lower part of the joint capsule where the tear occurred. Bandaging the arm to the side is condemned as bad practice. The standard procedure is to abduct the arm immediately after reduction and maintain it at ninety degrees on a splint. It is taken off the splint in from ten to fourteen days, and carried in a sling at the side for a week or more.

The Arthritides and Focal Infection.—The focus of infection may be found in the oral cavity, sinuses, intestinal tract, gall-bladder, or in the genito-urinary tract. V. P. Gibney³⁹ draws the following conclusions :—

A focus of infection should be sought for in every case of arthritis in which tuberculosis, malignancy, or trauma is not a self-evident cause. A mono-articular arthritis demands the same investigation as a polyarticular arthritis. So long as the treatment of a focus of infection does not give relief, it cannot be assumed that the infection is at an end. The arrest of an infection does not mean that the exudates in and around a joint will disappear unless orthopædic measures are employed to bring about resolution and restoration of function. There may be more than one focus of infection. As many organs are exposed to bacteria of a pus-producing nature, a careful study of these organs should be the rule.

H. S. Chapman⁴⁰ describes the results obtained in treatment of chronic arthritis by the removal of a distant focus of infection, and says that the most common foci of infection are the teeth, tonsils, genito-urinary tract, sinuses, bronchi, gall-bladder, gastro-intestinal tract, pancreas, and appendix, and the organisms most commonly found are streptococci, gonococci, staphylococci, and pneumococci. Every case of chronic and acute arthritis is likely to be treated on the presumption that it is due to infection or trauma. As regards treatment, 42.3 per cent of his cases due to infection from a focus in the genito-urinary tract showed definite improvement. With the teeth as a source of infection, 61.5 per cent showed rapid and marked improvement; 15.3 per cent did not improve. Of 7 cases with removal of tonsils, 4 improved. The most striking results were obtained when the focus was in the genito-urinary tract.

S. L. McCurdy,⁴¹ in an article on focal putrefactions and their bearing on osteo-arthritis and other diseases, considers that the orthopædic surgeon may not hope to arrest the onward advance of an osteo-arthritis until he has found the source of the toxin. The throat, mouth, alimentary canal, and genito-urinary tract should be investigated, as an infectious process in any one of these may be the cause of the distant joint and other diseases by toxin through the blood-stream.

Syphilitic and Tuberculous Joints.—P. W. Roberts⁴² considers it unwise to make a diagnosis of joint tuberculosis until the possible presence of inherited syphilis is eliminated by five or six weeks of vigorous antiluetic treatment.

Obturation of Bone Cavities by Muscle Strips.—Closure of cavities, of the kind which are difficult and require a long period of time by epidermization, took place, when they were filled with muscle strips, in from twenty-one to thirty-one days in three cases reported by R. Grégoire.⁴³ The cases had extensive cavities secondary to an osteomyelitic process, and bone lesions which were surrounded by a thick muscle-sheath. It is not known whether the muscle strip degenerates into fibrous tissue or undergoes osseous transformation, but the cavity fills and suppuration ceases. The cavity should be cleared of sequestra, curetted, trimmed, and filled with muscle at one stage. The strip of muscle should have a broad pedicle, and be long enough for retraction to take place.

Röntgenographic Appearance, Diagnosis, and Pathology of some Obscure Cases of Bone Lesions.—As a result of x-ray examination in obscure lesions of bones, W. L. Lovett and S. B. Wolbach⁴⁴ come to the following conclusions:—

The diagnosis of infectious lesions of bones would be simple if each infectious agent always produced the same reaction. The pyogenic bacteria alone may be counted upon to conform to type: at first destruction of tissue, followed by repair—which, in the case of bone, means necrosis with more or less local disappearance of lime salts, followed by new bone-formation from adjacent healthy bone structures.

Syphilis affects bone in two ways, both effects of the proliferative reaction

of the causal agent, and results either in the destruction of bone or new formation of bone. Both effects may occur in the same case.

Tuberculosis presents more possibilities. There may occur: (1) Exudate, fibrinous or puriform; (2) Discrete proliferative lesions, the tubercle, which may progress slowly or rapidly, with much or little caseation; and (3) A diffuse proliferative reaction, following the exudative, essentially tuberculous granulation tissue, with much or little caseation.

The important lesson from the pathological study of this series of cases is the reminder that tuberculosis in bone may simulate any other infectious process in location and character of lesion. Diagnosis from x-ray studies alone is therefore occasionally impossible, and recourse must be had to other clinical evidence, and when possible to pathological examination.

REFERENCES.—¹*Lancet*, 1920, i, 1048; ²*Presse méd.* 1920, May 1; ³*Amer. Jour. Surg.* 1920, xxxiv; ⁴*Lancet*, 1920, i; ⁵*California State Jour. Med.* 1920, xvii; ⁶*Amer. Jour. Orthop. Surg.* 1918, Aug.; ⁷*Orthopedic and Reconstructive Surgery* (Saunders); ⁸*Lancet*, 1920, i, 537; ⁹*Jour. Amer. Med. Assoc.* 1920, lxxiv; ¹⁰*Lancet*, 1920, i, 812; ¹¹*Wisconsin Med. Jour.* 1920, xviii; ¹²*Ann. of Surg.* 1910, Sept., 296; ¹³*Ibid.* lxxi; ¹⁴*Ibid.*; ¹⁵*Surg. Gynecol. and Obst.* 1920, xxx; ¹⁶*Amer. Jour. Orthop. Surg.* 1918, Aug.; ¹⁷*Orthopedic and Reconstructive Surgery* (Saunders); ¹⁸*Lancet*, 1920, i; ¹⁹*Surg. Gynecol. and Obst.* 1920, xxxii; ²⁰*Berl. klin. Woch.* 1920, lvii; ²¹*Jour. of Orthop. Surg.* 1920, x.s. ii; ²²*Ibid.*; ²³*Boston Med. and Surg. Jour.* 1920, xxxii; ²⁴*Military Surgeon*, 1920, xlv; ²⁵*Berl. klin. Woch.* 1920, lvii; ²⁶*Deut. med. Woch.* 1920, cxlvi; ²⁷*Med. Record*, 1920, xcvi; ²⁸*Zentralbl. f. Chir.* 1920; ²⁹*Surg. Gynecol. and Obst.* 1920, xxxii; ³⁰*Ibid.* xxx; ³¹*Ibid.* xxxii; ³²*Ibid.* xxx; ³³*Amer. Jour. Surg.* 1920, xxxiv; ³⁴*North-west Med.* 1920, xix; ³⁵*Minnesota Med.* 1920, iii; ³⁶*Brit. Med. Jour.* 1920, i; ³⁷*Practitioner*, 1920, civ; ³⁸*Jour. of Orthop. Surg.* 1920, ii; ³⁹*Amer. Surg.* 1920, lxxi; ⁴⁰*Jour. of Orthop. Surg.* 1920, ii; ⁴¹*Amer. Jour. Syph.* 1920, iv; ⁴²*Jour. de Chir.* 1920, xv; ⁴³*Surg. Gynecol. and Obst.* 1920, xxxi.

THE EDITOR'S TABLE.

Samples (not returnable) and particulars for this section should be sent to The Editor, 'Medical Annual' Office, Stonedridge, Bristol, on or before NOVEMBER 25.

We are anxious to express no opinion except as a result of practical knowledge, and it is owing to this fact that a notice in the MEDICAL ANNUAL has come to be valued.

NEW PHARMACEUTICAL PRODUCTS AND DIETETIC ARTICLES.

We are always ready, when a sufficient quantity is sent to us EARLY IN THE YEAR, to arrange for these to be tested in hospital practice and reported upon; under other circumstances our knowledge is necessarily more limited: but frequently the simple information as to where a particular preparation can be obtained is all the practitioner requires.

NEW MEDICAL AND SURGICAL INSTRUMENTS AND APPLIANCES.

We give Inventors and Manufacturers the opportunity of bringing their work before our readers entirely free of cost to themselves, subject only to the following conditions:—

(1) Each article sent for notice must have the novelty or improvement claimed for it clearly stated upon a SEPARATE sheet or sheets of paper. This should have attached to it any illustration (WHICH MUST BE SMALL) for which insertion is desired, and also bear the maker's name. The attention of firms who send a large number of articles for notice is particularly directed to the above condition, as each article has to be sorted into its proper department before it can be considered.

(2) Medical Inventors should merely describe the instrument or appliance, and avoid giving technique of operations.

The Editor is not able to accept reference to circulars, catalogues, or literature as a compliance with these conditions.

PROGRESS OF PHARMACY, DIETETICS, ETC.

Antirheumatic Vaccine (St. Mary's Hospital) is prepared from numerous strains of streptococci isolated from the mouth, intestine, and genito-urinary tract of patients suffering from rheumatism and rheumatoid arthritis. Many observers have shown that chronic rheumatism and rheumatoid arthritis follow streptococcal infections of the mouth, intestine, or genito-urinary tract, and in a large number of cases good results have followed the administration of a vaccine prepared from cultures of streptococci obtained from those situations.

The vaccine is supplied in three dilutions, respectively containing 20, 50, and 500 million mixed streptococci per c.c., in bulbs of 1 c.c.; the strongest of the dilutions may also be had in bottles of 25 c.c.

It is recommended that a series of weekly doses should be given, commencing with 5 million and gradually increasing, provided no general reaction occurs, up to 500 million if necessary. (Parke, Davis & Co., London.)

Argentum (Collosol) differs materially from the molecular solutions of organic salts of silver, such as 'protargol'. The latter undoubtedly have antiseptic properties, but also exhibit considerable penetrating power when applied to epithelial membranes, causing necrosis of the underlying tissues, for it is a well-known fact that a substance to be bacteriotropic must also be organotropic. In the case of collosol argentum, the silver, being in the colloidal state, possesses little or no penetrating power *per se*, but being exhibited in a saline medium, the latter rapidly passes by osmosis through the tissues, and the invading bacteria are brought into contact with the colloidal silver and the danger of complications is avoided. Thus it has been used for months without staining the conjunctiva. It has been used with success in pyorrhœa, gonorrhœa, and leucorrhœa, and also by injection into the bladder in cases of cystitis.

(The British Colloids Ltd., 22, Chenies Street, W.C.1.)

Argulan (Dimethyl-phenyl-pyrazolon-sulphamino-mercury).—This is a new organic mercurial preparation of exceptionally high potency, and, at the same time, low toxicity. Organic mercurial compounds are now taking the place of the inorganic ones in the treatment of syphilis, and argulan is a distinct improvement on other organic members of this class, as in this the mercury is given up most readily. It is manufactured by the Swiss Serum and Vaccine Institute, Berne, and is issued in doses of 0.2 gr. The injections are in sealed containers, which themselves act as a hypodermic syringe. Particulars can be obtained from Messrs. R. Sumner & Co. Ltd., Liverpool.

Aseptoids are intended for making solutions, and are manufactured in a square form instead of the usual round pastille shape, so as to avoid mistakes in administration. The aseptoids of the present production are these according to the late Dr. McNaughton Jones' formula—nasal, antiseptic douche, corrosive sublimate, mercuric potassium iodide, potassium permanganate, and sodii chloridum co. We may mention that these aseptoids are moulded into shape and are not compressed, so that they are very rapidly dissolved. (Oppenheimer, Son & Co. Ltd., London.)

Bromeroin.—The British Colloids Ltd. have put up a combination of bromoform, heroin, cherry laurel, and terpene hydrate, with a colloidal base. It is a very palatable preparation, and can be used with confidence for cases of irritable cough.

Bynotone.—Under this name Messrs. Allen & Hanburys Ltd. prepare a granular powder which contains bone marrow, yeast, nuclein, hæmoglobin, and malt extract. It is quite palatable, and will be preferred to the viscous compounds of malt which are usually prepared. It is rich in vitamins, and contains only 1 per cent of moisture. It is a most elegant preparation.

Chenopodium Oil Capsules.—The oil distilled from *Chenopodium anthelminticum* (American wormseed) has been found extremely effective for expelling round-worms, and is generally effective in cases of ankylostomiasis. It has also been recommended as an amebicide. It is best to administer it in gelatin capsules when the stomach is empty, and to follow it with a cathartic to prevent absorption of the drug. Messrs. Parke, Davis & Co. supply gelatin capsules containing either 5 or 10 min. of the oil, and this is distinctly the best way of administering this very effective remedy.

Confectio Sennæ c. Petroleo.—This is an excellent laxative containing equal parts of confection of senna and purified petroleum. It is prepared by Messrs. R. Sumner & Co., Liverpool.

Cuprum (Collosol).—These contain 0.05 per cent of copper as cuprous subhydroxide. It appears to have given excellent results in the treatment of cancer.

Certain metals, in the colloidal condition, act as catalysts or oxygen carriers, amongst which is copper. The well-known inhibitory action on growth, specific to copper, points therefore to colloidal copper as a probable remedial agent. Results are in many cases satisfactory, particularly in initial stages of the growth and in prevention of recurrence after operation. If there is present a streptococcus, injections of collosol manganese should be given alternately with the copper. For local application, suppositories and pessaries are supplied for rectal or vaginal use, and these will be found of great service, particularly where there is discharge.

In some cases, although an improvement is manifested, this is not maintained, and injections of a reducing agent such as pallamine (collosol palladium) should be given in order to produce a different condition of the tissues by stimulation of the reducases. This should be given alternately with the copper or manganese. (The British Colloids Ltd., London.)

Diphtheria Bacillus Vaccine (St. Mary's Hospital) is introduced for use in the treatment of diphtheria 'carriers': also of convalescents from the disease who continue to harbour the organism. It has been found that such a vaccine renders 'carriers' innocuous much more quickly than any other treatment, and considerably shortens the period of convalescence after diphtheria—see *Lancet*, 1920, i, 706 and 885.

This vaccine is supplied in a dilution containing 50 million *D. diphtheriæ* in each c.c., in bulbs of 1 c.c. and in bottles of 25 c.c. It is recommended that 0.25 c.c. should be given for the first dose, and 0.5 c.c. four days later. Subsequently 1 c.c. should be given at intervals of four days whilst necessary. (Parke, Davis & Co., London.)

Elixir Ferri Iodidi—The drawback to iodide of iron is its particularly unpleasant taste. In the official syrup, this has not been overcome, and the preparation is nauseating to most patients, especially children. Messrs. R. Sumner & Co. Ltd., Liverpool, prepare an elixir ferri iodidi in which the difficulty of taste has been overcome, and the drug in this form may be easily administered, even to children.

Fecto is a non-toxic disinfectant of great potency. It is an aqueous solution of alkaline hypochlorites with a trace of free chlorine; altogether it contains about 4 per cent of available chlorine. It is a colourless fluid, possessing no very pronounced odour, and when suitably diluted is not irritating to mucous membrane or exposed tissues. One ounce of fecto diluted with seven or more ounces of water may be used for irrigating or dressing wounds, ulcers, abscesses, etc., also as a gargle in diphtheria or septic throat, as a nasal spray in ozæna, as a mouth-wash in infected conditions of the teeth and gums, and as a lotion in bromidrosis.

Fecto is an extremely active disinfectant; it is twelve times as powerful as pure carbolic acid, and is free from the dangers of that agent. It has many valuable uses in the sick-room and hospital wards—for the disinfection of towels, linen, utensils, floors, etc., as well as sputum, urine, or faeces. It does not stain white fabrics (on the contrary, it removes most stains), but it will affect the colour of dyed goods. It should be used wherever infectious disease occurs, and also for the maintenance of hygienic conditions in every home; it is particularly indicated for cleansing infants' feeding bottles, food receptacles, etc., and for disinfecting and deodorizing drains, sinks, etc. As, for these purposes, only 1 ounce of fecto needs to be added to 1 gallon of water, it is very economical in use. It is supplied in bottles of 8, 16, and 80 fluid ounces. (Parke, Davis & Co., London.)

Iodine (Collosol).—The aqueous preparation contains 1-500 of iodine, and is indicated in all cases where iodine is required. It is claimed that while 85 per cent of the ordinary iodides are excreted, colloidal iodine is absorbed and enters into molecular combination with protein to form an iodo-amino acid and eventually reaches the blood-stream. It can be given in doses of one to three teaspoonfuls by the mouth, or intravenously from 10 c.c. to 200 c.c. (The British Colloids Ltd., London.)

Konapro Biscuits.—When these biscuits enter into the ordinary diet of patients suffering from chronic constipation, the result is usually satisfactory. This is due to the fact that they contain a large amount of cellulose, which stimulates the intestine without causing mechanical irritation. The vitamins, organic acids, salts, and sugars which have been proved necessary to intestinal activity are retained, as they occur in the cellulose in its natural state. (Menley & James Ltd., 64, Hatton Garden, E.C.)

Lavettes.—These contain soap in the form of powder which is inclosed in tin-foil. One tablet is sufficient for washing. They will be found convenient when travelling, and for use in hotels and public places. (Oppenheimer, Son & Co. Ltd.)

Manganese (Collosol) has accomplished remarkable results in the treatment of furunculosis, and has formed the subject of an article by Sir Malcolm Morris in the *British Medical Journal*. It has also been used in gonorrhoea with excellent results.

The action of manganese seems to depend upon the formation of active oxygen and active hydrogen—stimulating the processes of oxidation and reduction naturally occurring in the body. It is used by intramuscular injections of 0.5 c.c. Ampoules are put up by The British Colloids Ltd., London, or it may be obtained in solution.

Metagen is a combination of the recognized types of fat-soluble and water-soluble vitamins in concentrated form—the fat-soluble A vitamin to which is attributed an antirachitic effect, the water-soluble B which is credited with growth-promoting and antineuritic properties, and the water-soluble C which possesses antiscorbutic power.

The administration of metagen is indicated in the treatment of deficiency diseases such as beri-beri, scurvy, marasmus, and malnutrition, as a supplemental therapeutic agent in rickets and pellagra, and as an adjuvant in ill-defined disorders of nutrition attributable to the lack of a balanced diet, or the use of foodstuffs deficient in vitamins (margarine, skimmed milk, bleached flour, over-cooked vegetables, polished rice, etc.). It is of service in the nutritional treatment of wasting diseases, anaemia, and other dyscrasias, and in convalescence from infectious and other debilitating diseases.

Metagen is supplied in soluble capsules containing 5 gr.; the dose for an adult is two capsules, twice or thrice daily; the dose for children is proportionately less. For young children a portion of the contents of a capsule may be withdrawn and given in a little water. (Parke, Davis & Co., London.)

Metramine with Acid Phosphate of Soda.—The combination of these remedies has been found very efficient in the treatment of cystitis and other genito-urinary troubles. Messrs. Oppenheimer, Son & Co. Ltd. have put them into a palatinoid which makes a convenient method of administration.

Mixed Acne Vaccine 'B' (St. Mary's Hospital).—As experience has shown that in some cases very little benefit follows the administration of so small a proportion of acne bacilli as is contained in the mixed acne vaccine hitherto supplied by the St. Mary's Hospital Inoculation Department, whereas an increase in the number of acne bacilli has resulted in prompt improvement, the Department has changed the formula of this vaccine so that in future each c.c. will contain 1000 million staphylococci and 500 million acne bacilli. This strength is not best suited to all cases, however, and it is suggested that treatment should be commenced with the 'A' formula, and recourse had to the 'B' if improvement is not observed. The Department also furnishes a

higher strength of the simple acne bacillus vaccine (containing 500 million organisms per c.c.) for use in those cases of acne that manifest little or no inflammation, when such do not respond to the weaker vaccine (20 million per c.c.) hitherto supplied. (Parke, Davis & Co., London.)

Mixed Gonorrhoea Vaccine (St. Mary's Hospital).—This vaccine is prepared to meet the indications when secondary infections have become superimposed on the original gonococcus infection. Each c.c. contains 500 million gonococcus, 100 million streptococcus, 1000 million staphylococcus, and 200 million diphtheroid bacillus.

The vaccine is supplied in bulbs of 1 c.c. and in bottles of 25 c.c. It is particularly suitable for use in the treatment of gleet or chronic prostatitis of gonorrhoeal origin, also of chronic gonorrhoea in the female. Weekly doses should be given, commencing with 0.2 c.c. and gradually increasing, provided there is no focal reaction, up to 1 c.c. (Parke, Davis & Co., London.)

Nasal Catarrh Tablets.—Messrs. C. J. Hewlett & Son Ltd., 35-42, Charlotte Street, E.C.2, have prepared a useful tablet for nasal catarrh. It contains quinine sulph. gr. $\frac{1}{2}$, camphor gr. $\frac{1}{2}$, ext. bellad. liq. min. $\frac{1}{2}$, tinct. aconite min. 1.

Nausea Tablets, Improved.—The recently-introduced local anæsthetic, apothesine, has been found to exert a very marked sedative influence on the gastric mucosa, and its addition to the time-honoured combination of bismuth and cerium oxalate in the formula of these tablets provides a useful remedy in all cases of nausea other than those arising from indigestion. The dose is one tablet, repeated if and as necessary. (Parke, Davis & Co., London.)

Nuclein Tablets.—Each tablet represents the amount of nuclein contained in 8 gr. of dried yeast. The administration of nuclein has been shown greatly to increase the number of leucocytes in the blood and to enhance the disease-resisting powers of the body. It is prescribed in various infections and disordered conditions, e.g., furunculosis, indolent ulcers, scrofula, tonsillitis, anæmia, general debility. The dose is 1 to 2 tablets half an hour before meals, and at bedtime. (Parke, Davis & Co., London.)

Oraloids.—Under this name Messrs. Menley & James Ltd. have put up some antiseptic throat tablets, which contain a combination of the essential oils having an antiseptic value, and will be found useful in all cases where such treatment is indicated.

Otalgan.—Otalgan is an anhydrous solution of 5 per cent extract of opium and phenyl-dimethyl-pyrazolon in glycerin. It is used for the conservative treatment of acute inflammation of the middle ear. In early cases it entirely stops both the pain and the inflammation.

Otalgan exerts its influence by osmotic pressure; the antiseptic and anodyne principles of the drug pass through the drum, and at the same time the septic fluid is drawn out.

Prepared by the Swiss Serum and Vaccine Institute, Berne, Switzerland. Full particulars can be obtained from the agents, Messrs. R. Sumner & Co. Ltd., Liverpool.

Pallamine is palladium in the colloidal form. Palladium is a metal closely associated with platinum. It is more useful than platinum, and therapeutically it is more active. This colloidal preparation is a non-toxic, stable, sepia-coloured liquid, and is supplied in ampoules, the contents of which are ready for intravenous and intramuscular injection. It was introduced by Mr. J. E. R. McDonagh in 1917.

It is recommended in the acute stages of gonorrhoea when the disease is limited to the anterior part of the urethra. It is injected intramuscularly in doses of 0.5 c.c., and should be only regarded as an adjunct to the ordinary treatment. (The British Colloids Ltd., London.)

Placenta Substance Tablets.—Each of these tablets contains 5 gr. of desiccated (equivalent to 40 gr. of fresh) bovine placenta, the administration of which has been adopted in cases of defective mammary development during the later stage of gestation, also in deficient lactation and in agalactia; it has also been employed in pernicious vomiting of pregnancy. The usual dose is 1 tablet thrice daily. (Parke, Davis & Co., London.)

Pulticine.—This is intended for use as a poultice, and retains its heat much longer than other substances used for the purpose. It has a base of kalk, and is both antiseptic and stimulating. Messrs. Oppenheimer, Son & Co. Ltd. are the manufacturers.

'Spasmalgin'.—'Spasmalgin' 'Roche' is a combination of papaverine, 'omnopon', and atrinal. By reason of its composition, it is particularly adapted for the relief of spastic contractions of the plain-muscle organs arising from pathological conditions of irritation, and for the alleviation of the concomitant pain of these functional disturbances. In consequence of its papaverine content, 'Spasmalgin' has a relaxing effect on the smooth muscle of organs which are in hypertonic condition or subject to excessive peristalsis, and, as a result of the restoration of normal tone, the painful symptoms subside. This analgesic effect is reinforced by the general sedative action of the small 'Omnopon' content.

The remaining constituent of 'Spasmalgin', viz., 'Atrinal' 'Roche', is an atropine derivative, in which, however, the peripheral properties of the atropine (which produce stimulation of the vagus, inhibition of secretion, and mydriasis) are suppressed, while the therapeutically valuable stimulant effects on the central nervous system appear to be considerably strengthened. Atrinal consequently has a stimulating action on the respiratory centre, and increases the number and depth of the respirations. It is supplied in tablets and injections by The Hoffmann-La Roche Chemical Works Ltd., 7 and 8, Idol Lane, E.C. 3.

Sulphur (Collosol).—The preparations of sulphur made by The British Colloids Ltd. are a great improvement on the ordinary methods of using sulphur, both internally and externally. When given internally it is better to give a teaspoonful in a wineglassful of water, and not dispense it diluted with water. A sulphur bath may be made by dissolving a bottle of concentrated collosol sulphur in the water of the bath. This is a very useful treatment in many cases.

Tablet Aspirin and Co.—A useful tablet for nerve pains, migraine, etc., is one containing aspirin $2\frac{1}{2}$ gr., phenacetin 2 gr., caffeine $\frac{1}{2}$ gr. These are put up by Messrs. Menley & James Ltd., London.

Tetraglandin Palatinoids.—Much has been written concerning the advantage of giving glandular substances in association. Messrs. Oppenheimer, Son & Co. Ltd. have put up a palatinoid containing thyroid $\frac{1}{2}$ gr., pituitary ext. $\frac{1}{2}$ gr., ovary and testis (amount not stated). We doubt whether, if a patient really required either thyroid or pituitary extract, the dose would be sufficient. On the other hand, patients requiring ovarian extract are often very sensitive to pituitary extract. We think that this homotone treatment of mixed glands best suited for patients of the neurasthenic class, and it is for such patients this palatinoid is intended.

Turpo-capsicum is a stimulating application consisting of the oleo-resin of capsicum combined with turpentine and oils of croton and cajuput. It may be used either as a powerful embrocation, or in place of a mustard plaster. For children, the preparation should be diluted with three or four times its weight of cosmine. It is manufactured by Messrs. R. Sumner & Co. Ltd., Liverpool.

Vaccineurine is a mixture of several bacteriolytic vaccines which destroy neurotropic micro-organisms and which have proved after extended trials to be of great value in the treatment of neuralgia, neuritis, and sciatica. Injections are made in the extensor muscles of the arm, if possible in the spaces between the tissues, or intramuscularly in the gluteal region. The full treatment consists of three series, in all eighteen injections: these are graduated up to the maximum (or 18th) dose. The first series (6 doses) may be regarded as the immunizing doses; the second and third series (12 doses) are curative. They are prepared in Switzerland, and full particulars can be obtained from Messrs R. Sumner & Co. Ltd., Liverpool.

Vitmar.—It may not be difficult to prescribe a diet containing all the vitamins necessary in any case of malnutrition or deficiency disease, but it is not always easy to get this carried into practice. It is therefore of great advantage to have a preparation which contains all the three essential vitamins, and which can be administered as a remedy.

Vitmar is manufactured by Messrs. Callard and Co., 74, Regent Street, W., from wheat, bone-marrow, eggs, fruit, and sugar. It has a pleasant taste, and children take it readily.

MEDICAL AND SURGICAL APPLIANCES.

Anæsthetic Unit for Intratracheal Insufflation, etc.—For dosimetric anæsthesia by the method of intratracheal insufflation, Dr. Clarence Mott, of Burslem, has devised this modification of the well-known apparatus of Mr. Robert E. Kelly, of Liverpool. To Kelly's ether apparatus has been added a flowmeter gauging the air-current, dosimetric ether and chloroform chambers, a sight-feed nitrous oxide and oxygen bottle, and a water manometer for giving the respiratory index.

The flowmeter has enabled the makers to place dials above the ether and chloroform chambers, which state in plain figures the percentages of anæsthetic in the air-stream being administered under varying conditions of temperature and volume. The graduating of the dials has been done by Dr. A. Waller's gravimetric method.

The chloroform and ether chambers are fitted with water jackets for stabilizing their temperatures, as originally suggested by Mr. H. M. Page. The dosimetric feature of the apparatus and its additions appear to enlarge the scope of the intratracheal and pharyngeal insufflation method. A fitting has been devised to obviate the inconvenience of charging the air of the theatre from time to time with anæsthetic during the phase of negative pressure.

Provision is made for the inclusion of oxygen for artificial respiration work and the regulation of the air pressure in the apparatus where electric control is not sufficiently delicate. The mercury safety valve is of the standard Kelly type.

There are many other points in the construction and method of use of the apparatus which cannot be fully dealt with here, but briefly it is thought that the apparatus will place at the service of the anæsthetist a convenient anæsthetic unit for all forms of inhalation anæsthesia, and that the combined advantage of the flowmeter and dosimetric dials should remove from his path any difficulties in controlling the amount of anæsthetic given in each case, and place at his command any desired percentage of chloroform or ether, and any desired volume of air, or proportion of N_2O and O .

Messrs. Down Bros. Ltd., St. Thomas's Street, London, S.E., are the makers, from whom further particulars can be obtained.

Aspirating Syringe.—A special syringe has been designed by Mr. Claude H. Mills, of the Military Hospital, Rochester Row, for aspirating suppurating buboes (*Fig. 86*). Its special features are: (1) A large-bore fenestrated needle, with stilette to render it

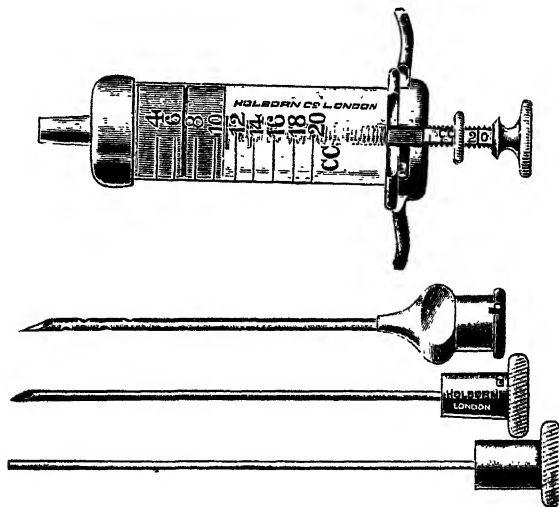


Fig. 86.

patent after introduction; (2) A probe for clearing the needle should it become blocked during aspiration; and (3) A large bore to nozzle of syringe to permit of the passage of inspissated pus.

We think the syringe will prove useful for many purposes where pus and fluid have to be aspirated. It is supplied by The Holborn Surgical Instrument Co. Ltd., London.

Arch Support (Adjustable).—This is a decided novelty in supports for flat-feet, and one which has considerable advantages over those at present in use. The support is obtained by a series of springs (*see Fig. 87*) which give it a certain resiliency which is absent from other appliances. It has the further advantage that these springs are adjustable, so that the height of the support can be instantly regulated, which is a very great advantage in the treatment of these cases.

Another good point is that the springs can be purchased separately if they should become damaged. Above all, they are lighter than the ordinary supports. They are made by Messrs. Salmon Ody Ltd., 7, New Oxford Street, W.C.

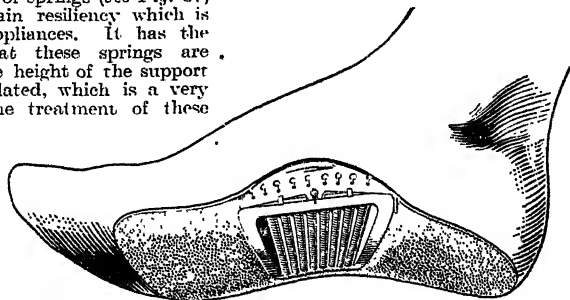


Fig. 87.

Auriscope.—We illustrate here (*Fig. 88*) an improved pattern of electrically-illuminated aural speculum, the lamp of which is so arranged that the light is thrown directly from the speculum and there is no reflection. It can be used with or without a magnifying lens, also with air inflation and for operating. It is a very convenient and practical apparatus. Messrs. Allen & Hanburys Ltd., 48, Wigmore Street, W.1., are the manufacturers.

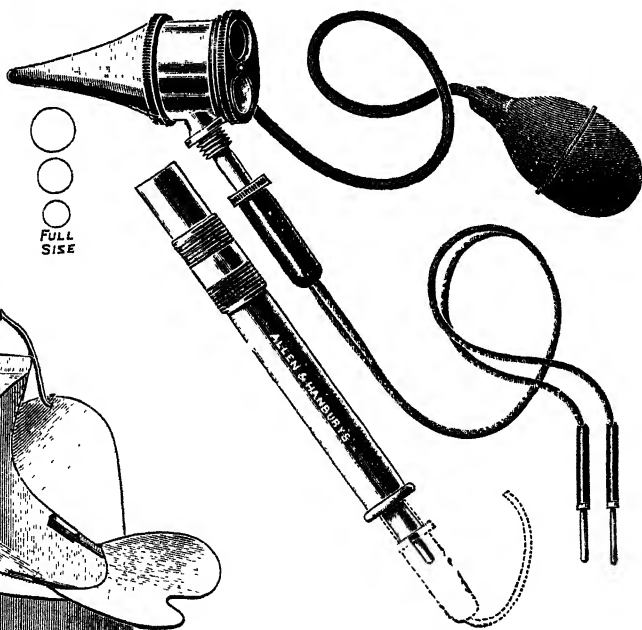
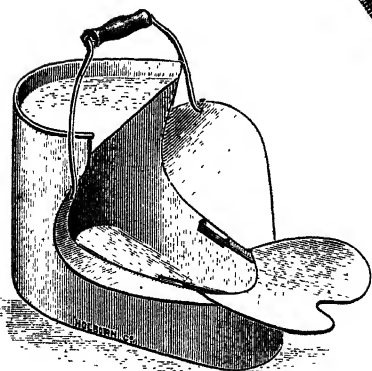


Fig. 88.

Bed-pan.—This bed-pan (*Fig. 89*) is designed by Corporal J. Griffin, R.A.M.C., and is specially useful for irrigating male patients confined to bed. The adjustable flap is shaped to fit under the penis and above the scrotum, and is arranged so that the fluid drains into the pan and so prevents any soiling of bedclothes. It is supplied by The Holborn Surgical Instrument Co. Ltd.

Fig. 89.



Belts (Men's).—A useful belt for wearing after operations (*Fig. 90*), especially when the abdomen has been opened higher up than usual, is manufactured by The 'Domen' Belts Co. Ltd., 456, Strand, W.C.2. It is made of a pure wool material, and has elastic insertions at the sides. It forms a comfortable and efficient support, and will also be found useful in cases where there is any tendency to gastropnoia. The firm have a large variety of designs for men's belts, and it is easy to select one well adapted to meet the requirements of special cases.

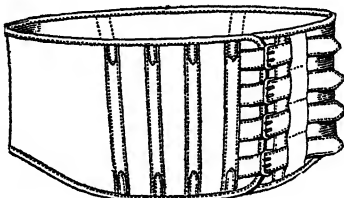


Fig. 90.

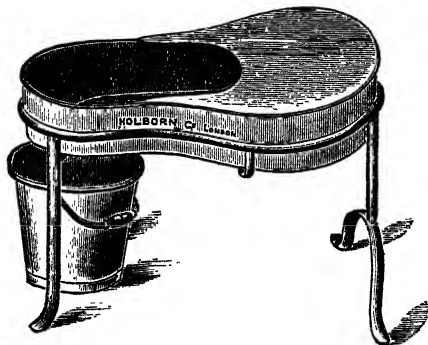


Fig. 91.

Bidet.—Dr. H. Wansey Bayly has lately designed a useful bidet (*Fig. 91*) for female use. Its top is slightly concave to prevent any fluid overflowing, and it slopes to the front so that the fluid drains into the pail.

This bidet is useful for patients suffering from venereal diseases, and is also a convenience in a specialist's consulting-room. (The Holborn Surgical Instrument Co. Ltd.)

Blood-pressure Outfit.—Under this name the Sanborn Company, 11, Victoria Street, S.W.1, have produced an apparatus for determining blood-pressure by means of a dial (*Fig. 92*) from which the results of both systolic and diastolic pressure can be easily read. It is packed in a leather case and is very portable.



Fig. 92.

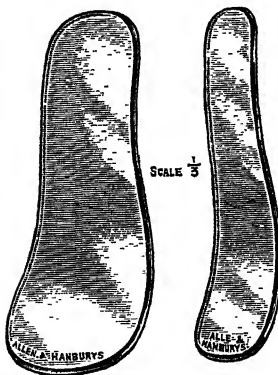


Fig. 93.

Brain Retractors (Sargent's).—These are made from glass, so that it is possible to see exactly what pressure is being placed on the brain, and also any bleeding points. The edges of these glass retractors are well rounded (*Fig. 93*), thus obviating any possibility of cutting, as with the thin metal retractors. They are made in two sizes, the ends of each instrument being of a different size, four sizes in all. (Messrs. Allen and Hanburys Ltd., 48, Wigmore Street, London, W.1.)

Cabinet, 'First Aid.'—We have received particulars of a 'First Aid' Cabinet very suitable for factories, schools, and institutions, which has been put up by Messrs. R. Sumner & Co. Ltd., of Liverpool. Made of oak and well finished, it is stocked with everything that may be required in cases of emergency. It costs, complete with all drugs and dressings, £8 10s. We note that both drugs and dressings are supplied in liberal quantities.

Cabinet (The National Insurance).—Most practitioners have found that the new Record Cards would not fit their existing cabinets, and it will be necessary for them to adopt other means of filing these cards. Messrs. R. Sumner & Co. Ltd. have brought out an excellent lock-up box, like a legal deed-box. This is divided into two partitions, and is a most efficient method of keeping the cards. It is well finished, being of strong metal, enamelled black outside and white in, and is provided with the necessary alphabetical guide cards.

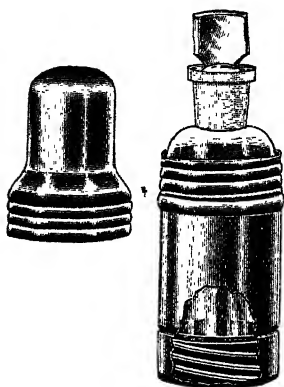


Fig. 94.

of the standard thicknesses, and immediate use, at 4s. a box.

Cord Depressor (for Hernia).—This instrument (Fig. 95), devised by Mr. Thomas Carwardine, of Bristol, facilitates suturing in the Bassini operation for hernia. The author states that with it better suturing can be done, and that its use saves about five minutes in each operation. It is passed beneath the divided flaps, and its shape enables it to be gradually withdrawn as the suturing proceeds. (Messrs. Down Bros. Ltd., St. Thomas's Street, London, S.E.)

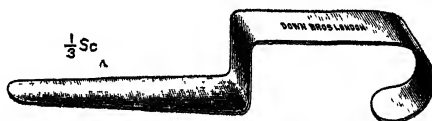


Fig. 95.

Ear-cone, and Bi-aural Stethoscope (Marr's).—Fig. 96 shows a new design for an instrument to aid those who are partially deaf. It is a sound-wave concentrator without any electrical device. A vibrating baffle-plate inside the ear-cone largely secures the bulk of the sound waves travelling on the inner surface of the instrument, and they thus reach the tympanum in larger amplitude. It can be obtained from The Marr Stethoscope Syndicate, 23, Reynell Road, Longsight, Manchester.



Fig. 96.

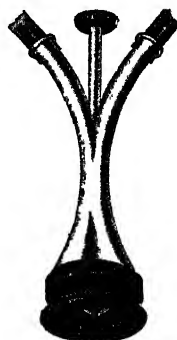


Fig. 97.

The same Syndicate have produced a new *Bi-aural Stethoscope* (Fig. 97) which has similar advantages to the above, and those who have used it speak very favourably of the distinctness and clearness of the sounds of the lungs and heart heard through it. Messrs. Mayer & Phelps, London, have the English, and Messrs. Arch. Young & Son, Edinburgh, the Scottish, rights in these patents.

Electric Lamp (The 'Fountain Pen').—Under this name we have had brought to our notice an excellent little pocket torch (*Fig. 98*), which can be carried in the waist-coat pocket like a fountain pen. It gives all the illumination necessary to examine

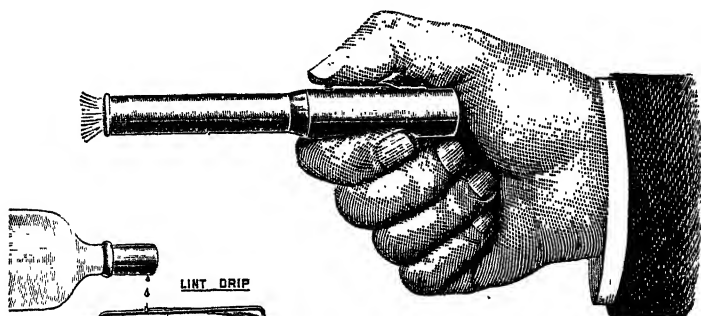


Fig. 98.

the ear, throat, and nose, and is likely to prove useful to the profession. It is supplied by Messrs. A. E. Braid & Co. Ltd., 30, Gower Place, W.C.1.



Fig. 99.

Ether Mask (The 'Picton').—The value of this invention is that it enables ether to be administered at the temperature of the body. This is secured by using a mask with a double dome of gauze, and an intervening cavity in which the cold vapour and warm expired air mix (*Fig. 99*).

The fabric soaked with ether is eight inches away from the face. Two other layers of fabric filter the ether vapour, permitting it to mix with warm expired air. Thus, the inspired mixed air and ether vapour are warmed automatically. Messrs. Browne & Sayer, 30, Highbury Place, N.5, are the manufacturers.

Flushing Dilator (Kollmann's).—The illustration (*Fig. 100*) shows an improved form of Kollmann's flushing dilator with inlet and outlet channel. This is preferred by many specialists, who consider it a disadvantage to have the return flow coming from the meatus into the cup, and further find that it gives a better flush and is more cleanly. It is supplied by The Holborn Surgical Instrument Co. Ltd., London.



Fig. 100.

Forceps.—*Glendining's Lung Forceps* is a modification of Duval's lung forceps. It is an extremely light instrument, and although fitted with teeth will not damage the delicate tissue; it is also very convenient for holding intestine, peritoneum, etc., or glands. The rack is at the end of the forceps (*Fig. 101*), so that there is not the risk of the glove being torn, which so often occurs. It is manufactured by Messrs. Allen & Hanburies Ltd., 48, Wigmore Street, W.1.

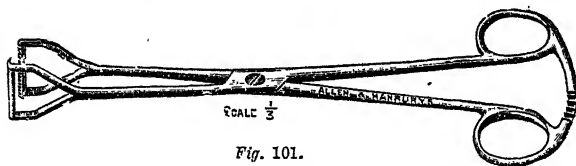


Fig. 101.

Packing or Tissue-holding Forceps.—This convenient little instrument (*Fig. 102*), has been made at the suggestion of Dr. W. Salisbury, of Bristol. It is a spring forceps with fenestrated blades, and has been found useful in abdominal packing. It can also be used as a tissue-holding forceps. The makers are Messrs. Down Bros. Ltd., London, S.E.

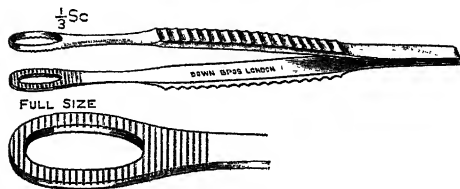


Fig. 102.

wounds. (Messrs. Allen & Hanburys Ltd., 48, Wigmore Street, W.1.)

Corbould's Tongue Forceps.—As will be seen from the illustration, these forceps are fitted with an extension on either side of the blade which prevents rotation

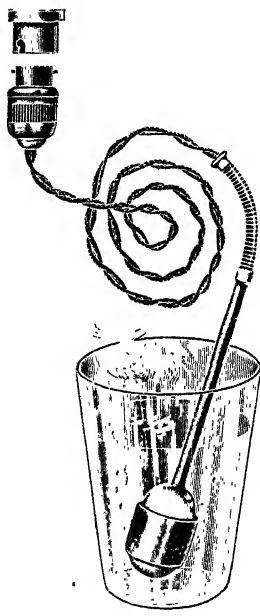


Fig. 104.

be used with alternating or direct current, and it is supplied for use with either 100-120 volts or 200-250 volts. The list number and voltage should be specified when ordering. This handy little appliance will find many uses in the sick room. It is excellently made, and costs 27s. 6d. It can be obtained from Messrs. A. E. Braid & Co. Ltd., 30, Gower Place, W.C.1.

Inhaler (The Stokes Patent Nasal).—This inhaler (*Fig. 105*) can be worn during the night whilst sleeping or used at intervals during the day, so that a constant antiseptic vapour can be maintained to the respiratory tract. There can be no doubt that this is the best method of using antiseptics to the air-passages, and that such treatment is valuable even in severe cases of bronchiectasis. Messrs. Oppenheimer, Son & Co. Ltd. supply this appliance.

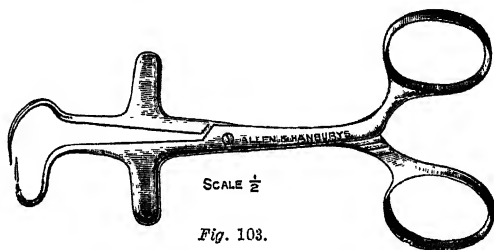


Fig. 103.

(see *Fig. 103*). It is also made flat so that it may be used under a mask. It will be found a very convenient appliance, and is made by Messrs. Allen & Hanburys Ltd., 48, Wigmore Street, W.1.

Immersion Heater (The 'Zeva').—This, as our illustration shows (*Fig. 104*), is an electric heater which can be immersed in any fluid to raise its temperature. It is extremely light in weight, strongly constructed, clean, handy, and economical. From tests carried out with 200-volts direct current, we have found that the heater will raise half a pint of cold water to boiling point in fourteen minutes at a cost of $\frac{1}{4}$ d. Apart from other uses it affords the greatest convenience at the toilet table, for it is sufficient to switch it on for a quarter to half a minute to heat water for cleaning the teeth or shaving.

The Ever-Ready 'Zeva' Heater is supplied with a length of silk-covered flex and a standard B.C. adaptor which fits into the bulb socket such as is installed in every household where electricity is available. It can



Fig. 105.

Instruments in Stainless Steel.—Messrs. Allen & Hanburys are making various instruments from stainless steel, such as knives, dissecting forceps, towel clips, gouges, chisels, hypodermic needles, etc. Instruments made from this material have great advantages over the usual form of nickel-plated steel instruments, as they possess all the properties of the usual models with the additional advantage that they will not stain or rust. All these appliances are of very great value, and we would especially direct attention to the 'stainless hypodermic needles', which will never be found rusty at the moment they are needed.

Stainless Steel Needles.—Messrs. A. E. Braid & Co. Ltd., 30, Gower Place, W.C.1, now supply needles in stainless steel. They stock a size to suit Record syringes at 5s. per dozen; hypodermic needles, interchangeable, with surgical or dental points, at 1s. 3d. a tube of six needles; and Baxter's lumbar-puncture needles at 6s. 3d. each. All these will neither rust, corrode, nor tarnish.

Stainless Steel Forceps.—Messrs. J. Gardner & Son, of 32, Forrest Road, Edinburgh, also supply a number of different patterns of forceps made of stainless steel. They can be boiled or immersed in any solution without being stained. When removed from the sterilizer it is best to plunge them into clean water; they will then remain always bright.

Irrigator (Urethral).—*Fig. 106* shows Canny Ryall's adjustable urethral irrigator, such as is used at All Saints' Hospital for genito-urinary diseases, for douching and water dilatation.

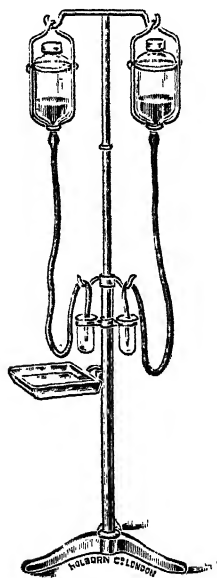


Fig. 106.

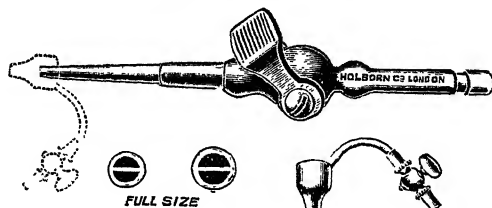


Fig. 107.

One reservoir is kept for use with fluids that stain, such as permanganate of potash, and the other for clear fluids. The tray is useful for holding instruments, nozzles, etc.

The next illustration (*Fig. 107*) shows Canny Ryall's urethral irrigating nozzles which can be used with this stand. These are both supplied by The Holborn Instrument Co. Ltd.

Metabolism Apparatus.—This is a very ingenious apparatus (*Fig. 108*) by which the consumption of oxygen at the end of a fifteen minutes' test can be ascertained by direct reading from a spirometer scale. It enables this important fact in basal metabolism to be determined without an arduous and expensive gas analysis.

Our readers who are interested can obtain a fully-descriptive pamphlet from the Sanborn Company, 11, Victoria Street, London, S.W.1.

Needle and Suture Carrier.—These instruments, made by Messrs. Down Bros. Ltd., St. Thomas's Street, London, for Mr. Thos. Guthrie, F.R.C.S., of Liverpool, are for use in his method of suturing the faecal pillars to arrest hemorrhage after tonsillectomy.

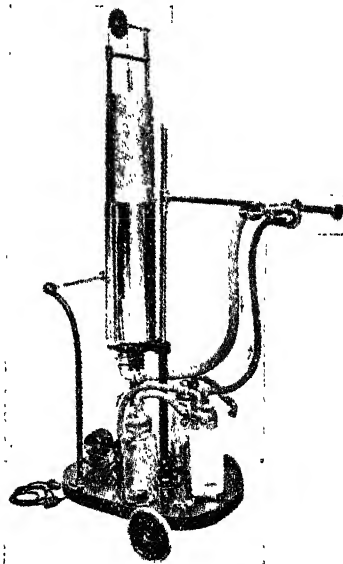


Fig. 108.

The slot-eyed needle (*Fig. 109*) is passed from behind forwards through the posterior and then the anterior pillar, taking up, on its way through, a thin layer of the tissue lining if thought advisable, i.e., if the fossa is very deep, as otherwise it would be necessary to pack it with a layer of gauze, which this manœuvre renders unnecessary.

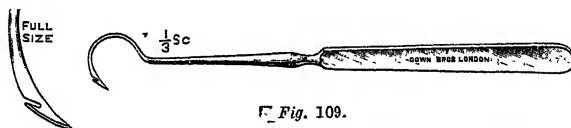


Fig. 109.

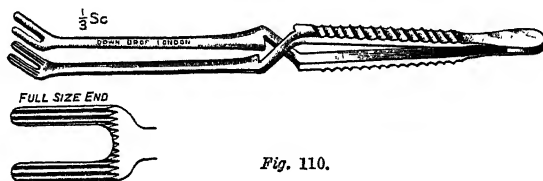


Fig. 110.

The suture-carrying forceps with bifurcated blades (*Fig. 110*) is charged with a piece of catgut and held in readiness in front of the fauces where the point of the needle emerges. The suture is thus easily picked up by the needle, withdrawn, disengaged, and tied.

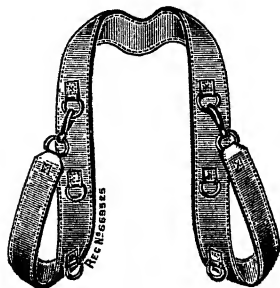


Fig. 111.

Obstetric Helper.—Under this name Dr. Bapthorn Smith has designed some strapping which can be relied upon in obstetric cases to hold the two knees firmly near the chin. It can be applied either before or after anaesthesia and whether the patient is in the dorsal or lateral position; its use will be readily understood from the illustration (*Fig. 111*). It is made by The Surgical Manufacturing Co. Ltd., 83-85, Mortimer Street, W.1., and costs 12s. 6d.

Ointment Applicator.—*Fig. 112* illustrates a urethral nozzle suggested by Colonel L. W. Harrison which can be screwed on to a collapsible tube of ointment. The nozzle facilitates the introduction of ointments deeply into the urethra. This is a convenient method of administering ointments both for the urethra and rectum. It is supplied by The Holborn Surgical Instrument Co. Ltd.



Fig. 112.

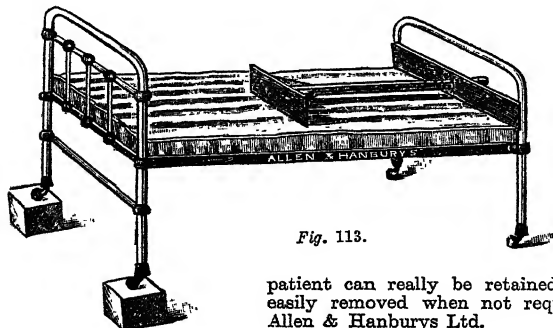


Fig. 113.

Prop (Cuthbert's).—We illustrate (*Fig. 113*) a convenient apparatus for maintaining patients in the Fowler position. It is one of the few methods by which a patient can really be retained in this position, and is easily removed when not required. Made by Messrs. Allen & Hanburys Ltd.

Saline Infusion Apparatus.—*Fig. 114* shows the well-known saline-infusion apparatus originally designed by Mr. N. S. Carruthers, F.R.C.S., in 1911, and in which certain improvements were subsequently carried out for him by Messrs. Down Bros. Ltd., London. One difficulty, however, still remained to be met, i.e., the extreme fragility of all hitherto procurable forms of vacuum flask. This has now been overcome, and this apparatus, as well as Murphy's and other infusion apparatus with vacuum containers, can be obtained from this firm with unbreakable reservoirs.

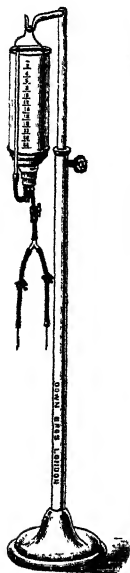


Fig. 114.

Scalpels.—In order to ensure a sharp knife for operating purposes, detachable blades can now be procured to fit handles of all sizes (*Fig. 115*); thus a used blade can be instantly replaced by a new one with a keen edge at less than the cost of resharpening an ordinary scalpel. The great convenience of this is obvious. It is called the Bard-Parker Knife, and can be obtained from The Surgical Manufacturing Co. Ltd., 83-85, Mortimer Street, W.1.

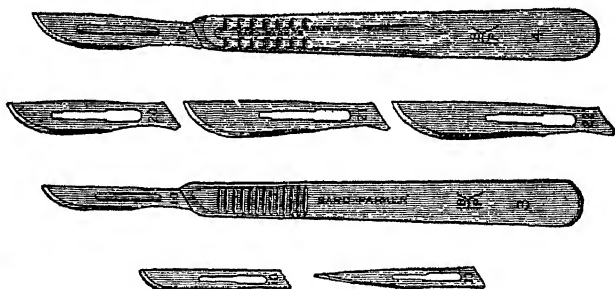
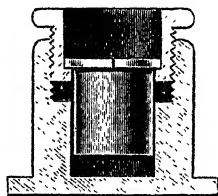
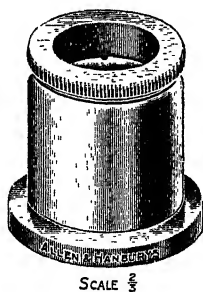


Fig. 115.

Sedimentation Cell (Eve's).—This cell is fitted with a rising floor which allows the cerebrospinal fluid to be drained off after the deposit of cells has taken place. The



SECTION

Fig. 116.

construction will be understood from the accompanying illustrations (*Fig. 116*). Messrs. Allen & Hanbury Ltd., 48, Wigmore Street, W.1, are the manufacturers.

Sounds (New Dilating).—The sounds illustrated (*Fig. 117*) have been made for Mr. D. Watson, of Glasgow. Their salient features are: (1) A round ball point. The author considers the ovoid form of Lister's sound tends to become caught at any obstructing point, and in the cul-de-sac which often exists at the extremity of the bulbous portion even in a healthy urethra. (2) The curve is sharper and more acute than in the usual pattern, to facilitate entrance into the posterior urethra. (3) Each sound tapers to the extent of four numbers in the Charrière scale. Expansion begins at 3 cm. from the ball tip, reaches its maximum in another 3 cm., and retains it for

6 cm., beyond which the diameter is gradually reduced, leaving a narrowed shaft which is not gripped by the meatus.

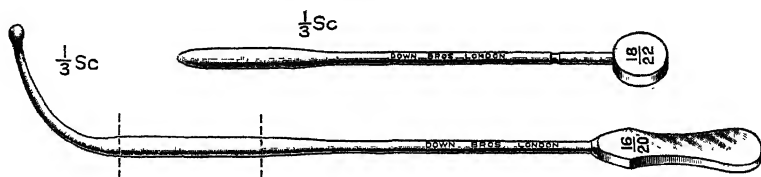


Fig. 117.

The sounds are made in two forms, straight and curved, for anterior and posterior urethra respectively, by Messrs. Down Bros. Ltd., St. Thomas's Street, London, S.E.

Sphygmomanometer (The 'Barton').—The special feature of this appliance is that it is furnished with a dial from which the recorded result can be easily read off by adding a 0 to the figures on the dial. This is not only more compact than the ordinary arrangement, but it is not liable to get out of order or be affected by any position in which it may be placed. We have tested it with other instruments, and find that it gives quite accurate results.

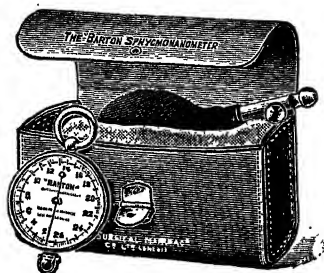


Fig. 118.

The very great advantage the appliance has is that it can be packed into the leather bag supplied (see Fig. 118) and occupies very little space. We consider it quite the best instrument for general use and well worth the small extra cost. The price is £4 4s., and it is supplied by The Surgical Manufacturing Co. Ltd., 83 & 85, Mortimer Street, W.1.

Splints.—*Todd's Splint for Colles's Fracture* (Fig. 119), the design of Mr. Alan H. Todd, M.S., F.R.C.S., has been expressly devised to prevent loss of supination without losing any of the advantages of the older methods.

In treating Colles's fracture, good results are often obtained by flexing the wrist sharply, e.g., over an anterior rectangular splint. This method is specially valuable in cases where the lower radial fragment tends to rotate backwards. Given perfect reduction and skilled after-treatment, full flexion and extension will always be recovered and pronation will be unimpaired, because the hand was put up fully pronated.

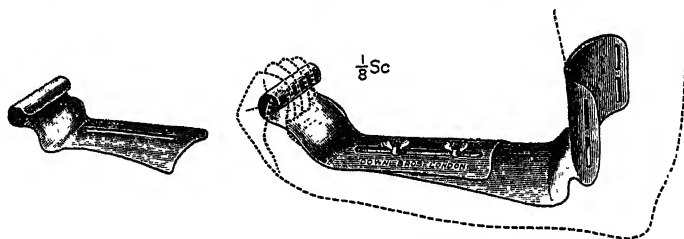


Fig. 119.

Supination is not a common movement, but its restoration is of importance in certain trades, e.g., in the case of plumbers, who cannot wipe a joint if this movement be lost. This splint keeps the arm fully supinated. It is made of sheet metal and is adjustable for any length of forearm. Two handpieces are provided, one of which will fit any patient.

The wrist is bent to a considerable angle, and a comfortable grip is provided for the fingers. It is not irksome to wear, as some supination splints are, and as a rule the splint can be removed after being worn for one week. With perseverance all movements should be completely restored. Messrs. Down Bros. Ltd., St. Thomas's Street, London, S.E., are the makers.

Shoulder-abduction Splint (Adjustable).—The splint illustrated (*Fig. 120*) has been devised by Mr. Alan H. Todd, M.S., F.R.C.S., of Guy's Hospital, for use in cases of

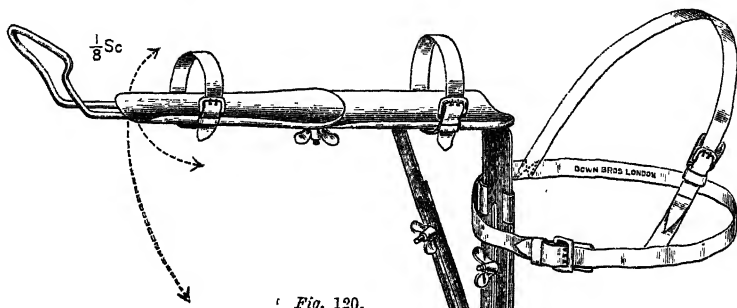


Fig. 120.

dislocation of the shoulder-joint or after injuries of any sort (fractures included) about the head or upper third of the humerus. It can be set at any angle (within a wide range), and the entire weight of the splint and the arm is borne by the pelvis. It is thought that this is a marked improvement on previous abduction splints which are supported by the chest-wall or abdomen.

The splint, as will be seen, is for treatment by means of rectangular abduction, and it is claimed that it is light and comfortable, and that this method gives better results than that of fixing the arm to the side. (Messrs. Down Bros. Ltd.)

Spoon for Collection of Faeces.—This consists of a stout glass tube into which fits a metal spoon having a flat handle (*Fig. 121*). On the shaft, at the level of the opening



Fig. 121.

of the tube, are fixed two collars, between which is placed a wisp of sterile wool forming a firm plug.

It will be found most convenient and cleanly for taking specimens, which would be then passed on to the laboratory; when emptied, the whole could be sterilized, fresh wool applied, and used again. (Messrs. Reynolds & Branson Ltd., Leeds.)

Stand and Clamp for Urethral Dilator.—Canny Ryall's stand and clamp for Kollmann's Dilator (*Fig. 122*) do away with the necessity of the patient holding the instrument, and possibly shifting its position. The stand is placed between the patient's legs, and the instrument fixed in position, and he can lie comfortably on a couch during the half hour or so required for dilatation. It is also useful as a cystoscopic clamp. This is supplied by The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, E.C.1.

Sterilizers.—The 'Brawoodine' Automatic Lighting Heating apparatus can be used in any room where there is an ordinary gas burner, to which it is connected by a piece of rubber tubing. Working on the Bunsen burner system, it generates intense heat, and it is therefore unnecessary to have water constantly on the boil. Not the least advantage is that no matches are required, as it has an automatic igniter.

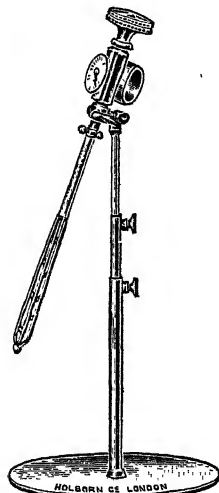


Fig. 122.

Fig. 123 shows the burner mounted on circular foot for small sterilizers about 6 or 8 inches in length, but Messrs. A. E. Braid & Co. Ltd., 30, Gower Place, W.C.1, can

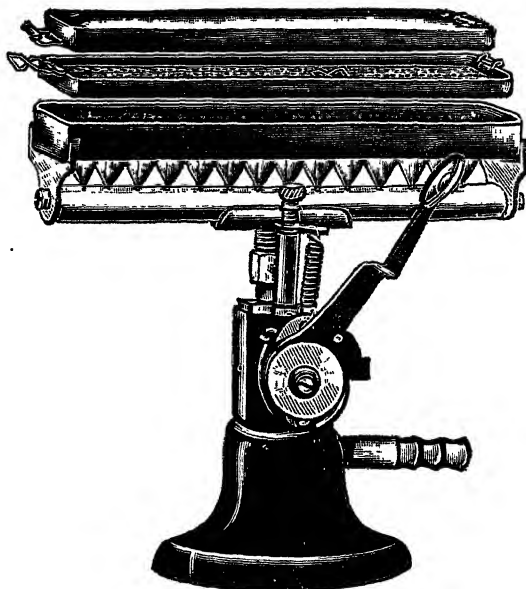


Fig. 123.

supply the improved model burner fitted with four feet, suitable to fit under sterilizers with stands, price £1 5s. each.

Stethoscope (Adjustable).—This is simply a straight monaural stethoscope capable of adjustment to various lengths by means of two metal tubes which are telescoped in one another (*Fig. 124*). It is designed by Dr. Noel Alder, who claims that the mitral

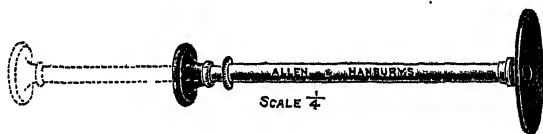


Fig. 124.

sounds of the heart, especially the second, are more clearly and loudly heard with the extended, than with the closed, instrument, and the reverse holds good for the aortic sound. (Messrs. Allen & Hanburys Ltd.)

Surgical Instrument Case.—Messrs. R. Sumner & Co. Ltd. manufacture a useful and comprehensive case of surgical instruments. It is devised by Mr. Arthur Evans, F.R.C.S., of Liverpool, and is carried by many of the principal ships sailing out of the port of Liverpool. It constitutes a most efficient and complete surgical equipment suitable for use on ships, for a colonial practitioner, or for an expedition. The case itself is made of specially seasoned oak that will not warp, and therefore all the drawers will continue to open easily even in hot and moist climates. These drawers contain a detachable tray into which all the instruments are fixed in racks, and are therefore easily transported, and any instrument can be found at once. The instruments can be varied to suit requirements. Everything in the case is of the best English manufacture. The outfit includes sufficient instruments and anaesthetics for an ordinary major surgical operation. It costs £55.

Syringe (Harrison's).—This is a particularly well-made syringe of 10-c.c. and 20-c.c. sizes, with the nozzle at the periphery, as shown in the illustration (Fig. 125). It is

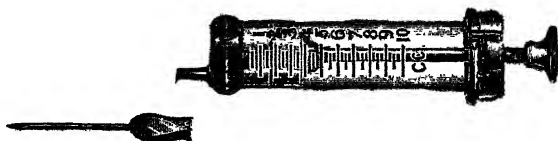


Fig. 125.

supplied with Dr. Walter Rundle's intravenous needle. This syringe is in regular use at the Lock Hospital and gives every satisfaction. (Messrs. A. E. Braid & Co. Ltd., 30, Gower Place, Gower Street, W.C.1.)

Syringe (Hypodermic).—We always examine hypodermic syringes very critically, because one that fails in a moment of emergency may endanger life. The 'Luc' is in every way a well-made and highly-finished product. It has a quartz glass barrel in which water can be boiled without fear of breaking, and has a well-fitting metal piston and a cap to go over the nozzle. The hypodermic needles are enclosed in a separate metal case, which protects them from the air and secures them from contamination. The whole is put up in a neat metal case. We can highly recommend this syringe to our readers, as we are sure it will give satisfaction. Messrs. Allen & Hanburys Ltd., 48, Wigmore Street, W.1, are the manufacturers.

The same firm also supply hypodermic needles of stainless steel which will never rust and be always ready for use.

Time Switch for X-ray Exposures.—This device, called the 'Ultima' Time Switch, is for automatically controlling the duration of x-ray exposures much as a time shutter does for ordinary photographic work. In operation it is purely mechanical, and being strongly made is not liable to get out of order (Figs. 126, 127).

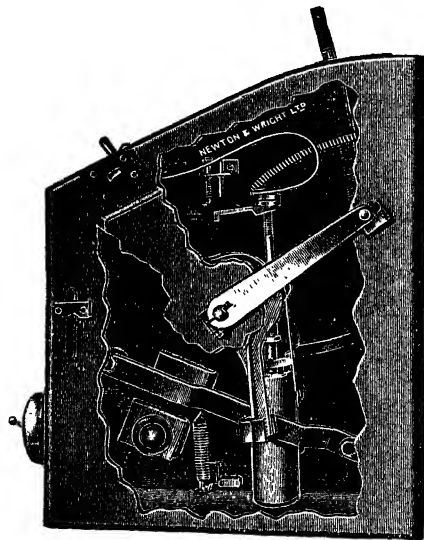


Fig. 126.

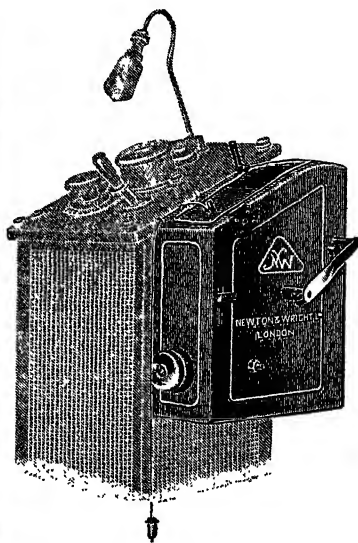


Fig. 127.

The essential feature is a copper contact, moving in a circular path which sweeps through a pair of fixed contacts and while doing so completes the circuit. The moving contact, which is actuated by a powerful spring, describes a complete circle, and is so arranged that it attains considerable velocity before reaching the fixed contacts,

thereby eliminating any time error due to inertia. The switch is set by means of a lever handle, and released at the required moment by sliding a knob or by pulling a cord. The time of exposure is controlled by means of a dashpot, which arrests the movement for a given number of seconds or fractions of a second, and this is 'set' by a regulating lever, moving along a divided scale. The whole range of the instrument is from 8 seconds to $\frac{1}{8}$ second, and the degree of accuracy attained renders it an extremely useful accessory to the radiologist.

It can be adapted to almost any existing switchboard, and as its action is entirely mechanical it will work with apparatus of any make or description.

Messrs. Newton & Wright Ltd., London, N.19, are the sole makers.

Tonsil Bayonet.—This is a convenient instrument for opening tonsil abscesses. The knife is fitted with a shoulder which prevents it being inserted too far (*Fig. 128*).



Fig. 128.

It is called the Scott Gillett Bayonet, and is made by Messrs. Allen & Hanburys Ltd., 48, Wigmore Street, W.

Urethral Anæsthesia.—We illustrate here Canny Ryall's urethral anæsthetic syringe (*Fig. 129*) for injecting an anæsthetic into the urethra, and a special form of clamp



Fig. 129.



Fig. 130.

(*Fig. 130*) for applying to the meatus to prevent the anæsthetic escaping after injection. These are supplied by The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, E.C.1.

Urethral Speculum.—This instrument (*Fig. 131*) is a modification of the ordinary cup-shield urethral speculum, wherein the shield is movable and can be fixed at any point along the speculum. This modification enables any particular field of operation, etc., to be held in view without disturbing the balance of the instrument. On introduction of the speculum, the shield is moved down to the glans and locked by means

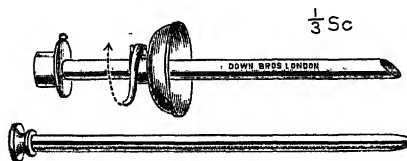


Fig. 131.

of the lever as soon as the affected area is brought into the field of vision. Keeping the cup in position, the speculum can be moved and locked again at any point during the examination.

The instrument has been found particularly useful in conjunction with Mr. W. Powell's cauterizing tube (*vide* MEDICAL ANNUAL, 1920) in the incision of peri-urethral abscesses and the endoscopic treatment of the urethra. (Messrs. Down Bros Ltd., London, S.E.)

Urethral Syringes.—Dr. F. Picken has invented a one-hand urethral syringe for self-injecting of potassium permanganate, etc. This syringe is much more easily handled by the patient and more cleanly than the ordinary urethral syringe with a plunger. The construction will be seen from our illustration (*Fig. 132*). It is supplied by The Holborn Surgical Instrument Co. Ltd., London.

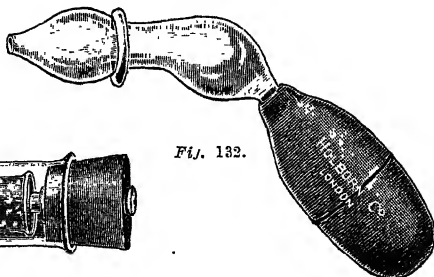


Fig. 132.



Fig. 133.

Fig. 133 illustrates an aseptic syringe with conical nozzle, contained in a glass tube, and so arranged that it can be carried in the pocket, always ready for use, without any leakage of the solution. It is a most practical little appliance, and costs 3s. 6d. It is supplied by Messrs. A. E. Braid & Co. Ltd., 30, Gower Place, W.C.1.

Urinometer (A Flat).—This instrument, being flat, does not revolve in the liquid and move about as those we have been accustomed to use. The scale is much easier to read and the whole instrument much more convenient in every way. We strongly recommend it. (Messrs. J. Gardner & Son, 32, Forrest Road, Edinburgh.)

Weighing Machine.—This is rather a novelty in weighing machines (*Fig. 134*). In spite of its small size (11 by 7 by 8 in.), it will give correct weights from 1 lb. to

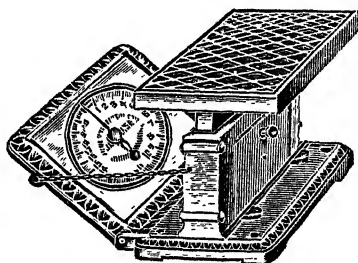


Fig. 134.

20 stone. It has a mirror attachment so that the person being weighed can see the weight reflected. The cost is £2 17s. 6d. They are supplied by Messrs. A. E. Braid and Co. Ltd., 30, Gower Place, W.C.1.

BOOKS OF THE YEAR.

A LIST OF THE PRINCIPAL MEDICAL WORKS AND NEW EDITIONS
PUBLISHED DURING 1920.

* * For the convenience of our readers any of the works in this list can be obtained through
Messrs. John Wright and Sons Ltd., 'Medical Annual' Offices, Bristol.

AMBULANCE AND NURSING.

- AMBULANCE HANDBOOK FOR BOY SCOUTS. By J. Gibson. 18mo, pp. 91. *Gale & Polden* Net 1s.
- AMERICAN RED CROSS IN THE GREAT WAR. By H. P. Davison. 8vo. Illustrated. *Macmillan* Net 16s.
- COURSE OF LECTURES ON MEDICINE TO NURSES. By H. E. Cuff. Cr. 8vo, pp. 264. *Churchill* Net 7s. 6d.
- DUTIES OF SISTERS IN SMALL HOSPITALS. By F. Norton. Cr. 8vo, pp. 82. *Baillière* Net 3s. 6d.
- FIRST AID IN EMERGENCIES. By E. L. Ehason. 3rd ed. 12mo. *Lippincott* Net 7s. 6d.
- FIRST AID TO THE INJURED AND SICK. By F. J. Warwick and A. C. Tunstall. 11th ed. 301 Illustrations. *Wright* Net 2s. 6d.
- INDEX OF PRACTICAL NURSING. By J. B. Cook. 2nd ed. Cr. 8vo, pp. 175. *Baillière* Net 6s.
- INDUSTRIAL NURSING. By F. S. Wright. Cr. 8vo. *Macmillan* Net 8s. 6d.
- LECTURES ON MEDICINE TO NURSES. By H. E. Cuff. 7th ed. *Churchill*. Net 7s. 6d.
- LECTURES ON SURGERY TO NURSES. By A. H. Todd. Cr. 8vo. *Arnold* Net 7s. 6d.
- LECTURES TO NURSES IN TRAINING. By M. Vivian. Cr. 8vo, pp. 95. *Scientific Press*. Net 2s. 6d.
- MANUAL OF NURSING PROCEDURE. By A. E. Pope. Cr. 8vo, pp. 607. *Putnam* Net 10s.
- NURSING OF CHRONIC PATIENTS. By E. C. Barton. 18mo, pp. 126. *Scientific Press* Net 1s. 3d.
- POCKET GUIDES TO FIRST AID IN CASES OF: I, Poisoning; II, Hæmorrhage; III, Insensibility; IV, Asphyxia; V, Fractures, Dislocations, and Sprains; VI, Wounds, Burns, Bites, Scalds, Rupture, and Minor Injuries. By Col. R. J. Blackham. On Linen Lined Cards. *Bale* Each Net 6d.
- SHORT HISTORY OF NURSING FROM THE EARLIEST TIMES TO THE PRESENT DAY. By L. L. Dock, R.N., in collaboration with I. M. Stewart, A.M., R.N. Cr. 8vo, pp. 392. *Putnam* Net 7s. 6d.
- STORY OF THE AMERICAN RED CROSS IN ITALY. By C. M. Bakewell. Cr. 8vo. Illustrated. *Macmillan* Net 12s.
- SURGICAL NURSING, AND THE PRINCIPLES OF SURGERY FOR NURSES. By R. Howard. Cr. 8vo, pp. 336. *Arnold* Net 7s. 6d.
- SURGICAL NURSING AND TECHNIQUE. By C. P. Childe. 3rd ed. Cr. 8vo, pp. 248. *Baillière* Net 6s.
- THEORY AND PRACTICE OF NURSING. By M. A. Gullan. 8vo, pp. 229. *Levis* Net 10s. 6d.

ANATOMY AND PHYSIOLOGY.

- AIDS TO OSTEOLOGY. By P. Turner. 2nd ed. 8vo, pp. 194. *Baillière* Net 4s. 6d.
- ANATOMY OF THE BRAIN AND SPINAL CORD. Revised by J. R. Whitaker. 5th ed. Cr. 8vo, pp. 256. *Livingstone* Net 12s. 6d.
- ANATOMY OF THE HUMAN SKELETON. By J. E. Frazer. 2nd ed. 4to. *Churchill* Net 36s.
- ANATOMY MNEMONICS. By A. S. Irving. 2nd ed. 32mo. *Livingstone* Net 1s.

- ATLAS OF THE SENSORY CUTANEOUS NERVES. By W. Ibbotson. Roy. 8vo. *Scientific Press* Net 7s. 6d.
- BODILY CHANGES. By W. B. Cannon. New ed. 12mo, pp. 311. *Appleton* Net 15s.
- COURSE OF PRACTICAL PHYSIOLOGY (Introductory to Physiology and Medicine). By G. A. Buckmaster and H. R. B. Hickman. *Wright* Net 5s.
- CUNNINGHAM'S MANUAL OF PRACTICAL ANATOMY. Revised by A. Robinson. 7th ed. Vol. II.—Thorax and Abdomen. Cr. 8vo, pp. 524. Vol. III.—Head and Neck. Cr. 8vo, pp. 568. *Oxford Medical Publications. Each Vol.* Net 12s. 6d.
- CYTOLOGY. With special reference to the Metazoan Nucleus. By W. E. Agar. 8vo, pp. 236. *Macmillan* Net 12s.
- DEVELOPMENT OF THE HUMAN BODY. By J. P. McMurich. 6th ed., revised. 8vo, pp. 511. *Kimpton* Net 18s.
- ENGINES OF THE HUMAN BODY. By A. Keith. 8vo, pp. 300. *Williams & Norgate* Net 12s. 6d.
- ESSENTIALS OF HUMAN PHYSIOLOGY. By D. N. Paton. 8vo, pp. 700. *Green* 25s.
- FUNDAMENTALS OF HUMAN ANATOMY. Including its Borderland Districts, from the View-point of a Practitioner. By M. Pitzman. 8vo, pp. 356. *Kimpton* Net 24s.
- GRAY'S ANATOMY: Descriptive and Applied. Edited by Robert Howden. Notes on Applied Anatomy, revised by A. J. Jex-Blake. Folio, pp. 1382. *Longmans* Net 42s.
- GUIDE TO ANATOMY, for Students of Medical Gymnastics and Massage. By E. D. Ewart. Demy 8vo. *Lewis* Net 16s.
- HANDBOOK OF PHYSIOLOGY. By W. B. Halliburton. 15th ed. *Murray* Net 21s.
- HISTOLOGY. By H. E. Jordan. Pp. 800. *Appleton* Net 25s.
- INTRODUCTION TO THE STUDY OF CYTOLOGY. By L. Doncaster. 8vo, pp. 294. *Cambridge University Press* Net 21s.
- MANUAL OF PRACTICAL ANATOMY. A Guide to the Dissection of the Human Body. By T. Walmsley. Part 1, The Upper and Lower Limbs. 8vo, pp. 184. *Longmans* Net 9s.
- MNEMONICS OF ANATOMY. Old Terminology. 7th ed., 32mo, pp. 48. *Kimpton* Net 1s.
- NEW PHYSIOLOGY IN SURGICAL AND GENERAL PRACTICE. By A. R. Short. 4th ed. Cr. 8vo, pp. 302. *Wright* Net 9s. 6d.
- NORMAL HISTOLOGY. With Special Reference to the Structure of the Human Body. By G. A. Piersol. 8vo, 12th ed. *Lippincott* Net 21s.
- PHYSIOLOGY. Part 4. 3rd ed. 'Catechism Series'. *Livingstone* Net 1s. 9d.
- PHYSIOLOGY AND BIOCHEMISTRY IN MODERN MEDICINE. By J. J. R. Macleod. 3rd ed. 8vo, pp. 1024. *Kimpton* Net 42s.
- PHYSIOLOGY AND NATIONAL NEEDS. Edited by W. D. Halliburton. 8vo, pp. 169. *Constable* Net 8s. 6d.
- PHYSIOLOGY AND PATHOLOGY OF THE CEREBROSPINAL FLUID. By W. Boyd. 8vo. Illustrated. *Macmillan* Net 30s.
- PIERSON'S HUMAN ANATOMY. 7th ed., revised. 8vo, pp. 2104. Illus. *Lippincott*. Cloth Net 38s. Two Vols. half leather Net 63s.
- POCKET ANATOMY. By C. H. Fagge. 8th ed. Fcap 8vo, pp. 320. *Baillière* Net 5s.
- PRACTICAL HISTOLOGY. By J. N. Langley. 3rd ed. Cr. 8vo., pp. 328. *Heffer* Net 10s. 6d.
- PRINCIPLES OF ANATOMY AS SEEN IN THE HAND. By F. W. Jones. 8vo. *Churchill* Net 15s.
- PRINCIPLES OF ANTE-NATAL AND POST-NATAL CHILD PHYSIOLOGY: Pure and Applied. By W. M. Feldman. 8vo. *Longmans* Net 30s.
- STARLING'S PRINCIPLES OF PHYSIOLOGY. Revised and largely re-written by H. Hartbridge. 3rd ed. Folio, pp. 1330. *Churchill* Net 25s.
- SURFACE ANATOMY. By C. R. Whittaker. 3rd ed. *Churchill* Net 7s. 6d.
- SURGICAL ANATOMY. By C. R. Whittaker. Cr. 8vo, pp. 177. *Livingstone* Net 5s. 6d.
- SURGICAL ANATOMY. 3 Parts. 2nd ed. 'Catechism Series'. *Livingstone* Each net 1s. 9d.
- SYNOPSIS OF PHYSIOLOGY. By F. Roberts. *Churchill* Net 15s.

BACTERIOLOGY.

- APPROVED TECHNIQUE OF THE RIDEAL-WALKER TEST. By S. Rideal and J. T. A. Walker. Cr. 8vo. *Lewis* Net 1s.
- DIAGNOSIS OF BACTERIA AND BLOOD PARASITES. By E. P. Minett. 3rd ed. Cr. 8vo, pp. 102. *Baillière* Net 4s. 6d.
- PRACTICAL BACTERIOLOGY, BLOOD WORK, AND ANIMAL PARASITOLOGY. Including Bacteriological Keys, Zoological Tables, and Explanatory Clinical Notes. By E. R. Stitt. 6th ed., post 8vo. *Lewis* Net 20s.

CHEMISTRY AND PHYSICS.

- APPLIED CHEMISTRY. Vol I. By C. K. Rinkler and H. Master. 8vo, pp. 292.
Lockwood Net 12s. 6d.
- CATALYSIS AND ITS INDUSTRIAL APPLICATIONS. By E. Jobling. 2nd ed. *Churchill*
 Net 7s. 6d.
- CHEMISTRY. 2 Parts. 3rd ed. 'Catechism Series'. *Livingstone* Each net 1s. 9d.
- DICTIONARY OF EXPLOSIVES. By A. Marshall. *Churchill* Net 15s.
- ELEMENTARY PRACTICAL CHEMISTRY FOR MEDICAL AND OTHER STUDENTS. By J.
 E. Myers and J. B. Firth. 2nd ed. 8vo, pp. 194. *Griffin* Net 4s. 6d.
- HANDBOOK OF PHYSICS AND CHEMISTRY. By H. E. Corbin and A. M. Stewart. 5th
 ed. *Churchill* Net 15s.
- HISTORY OF CHEMISTRY, FROM THE EARLIEST TIMES TILL THE PRESENT DAY. By
 J. C. Brown. 2nd ed. *Churchill* Net 21s.
- INDUSTRIAL ORGANIC ANALYSIS. By P. S. Arup. 2nd ed. *Churchill* Net 12s. 6d.
- INTRODUCTION TO PHYSICAL CHEMISTRY. 8th ed. By J. Walker. 8vo, pp. 433.
Macmillan Net 16s.
- JUNIOR INORGANIC CHEMISTRY. By R. H. Spear. *Churchill* Net 10s. 6d.
- LABORATORY MANUAL. By O. Folin. New ed., pp. 188. *Appleton* Net 8s. 6d.
- LABORATORY MANUAL OF ELEMENTARY COLLOID CHEMISTRY. By E. Hatschek.
Churchill Net 7s. 6d.
- LINK BETWEEN THE PRACTITIONER AND THE LABORATORY. By C. Fletcher and H.
 McLean. Cr. 8vo, pp. 91. *Lewis* Net 4s. 6d.
- NEWER METHODS OF BLOOD AND URINE CHEMISTRY. By R. B. H. Gradwohl and A.
 J. Blaivas. 8vo, pp. 418. *Kimpton* Net 30s.
- NOTES ON CHEMICAL RESEARCH. By W. P. Dreaper. 2nd ed. *Churchill*. Net 7s. 6d.
- NUCLEIC ACIDS: THEIR CHEMICAL PROPERTIES AND PHYSIOLOGICAL CONDUCT.
 2nd ed. By W. Jones. Roy 8vo, pp. 150. *Longmans* Net 9s.
- ORGANIC MEDICAL CHEMICALS (Synthetic and Natural). By M. Barrowcliff and F.
 H. Carr. Demy 8vo, pp. 348. *Baillière* Net 15s.
- PHYSICS. 2 Parts. 2nd ed. 'Catechism Series'. *Livingstone* Each net 1s. 9d.
- PRACTICAL BIOLOGICAL CHEMISTRY. By G. and Pierre T. Bertrand. Translated from
 the 3rd ed. by H. A. Colwell. 8vo, pp. 348. *Bell* Net 10s. 6d.
- PRACTICAL PHYSIOLOGICAL CHEMISTRY. By S. W. Cole. 6th ed. 432 pp. *Heffer*
 16s.
- TEXT-BOOK OF ORGANIC CHEMISTRY. By E. de B. Barnett. *Churchill* Net 15s.
- USE OF COLLOIDS IN HEALTH AND DISEASE. By A. B. Searle. 8vo, pp. 127. *Constable*
 Net 8s.

CHILDREN'S DISEASES.

- AIDS TO THE DIAGNOSIS AND TREATMENT OF DISEASES OF CHILDREN. By J. McCaw.
 5th ed., pp. 416. *Baillière* Net 6s.
- CARE AND FEEDING OF CHILDREN. By L. E. Holt. 10th ed., revised, pp. 219.
Appleton Net 6s.
- CARE AND FEEDING OF INFANTS AND CHILDREN. By W. R. Ramsay. Including
 suggestions on Nursing by M. B. Lettice. 8vo, 2nd ed. *Lippincott* Net 10s. 6d.
- COMMON DISORDERS AND DISEASES OF CHILDHOOD. By G. F. Still. 3rd ed. Pp. 862.
Oxford Medical Publications Net 16s.
- DISEASES OF CHILDREN (GOODHART'S). Edited by G. F. Still. 11th ed. 8vo. *Churchill*
 Net 32s.
- DISEASES OF INFANCY AND CHILDHOOD. By L. E. Holt and J. Howland.
 revised. Pp. 1161. *Appleton* Net 42s.
- LECTURES ON DISEASES OF CHILDREN. By R. Hutchison. 4th ed. *Arnold* Net 21s.
- DISEASES OF THE NEWBORN. By A. R. von Reuss. Translation revised by J. D.
 Rolleston. Roy. 8vo, pp. 638. *Bale* Net 52s. 6d.
- SIMPLIFIED INFANT FEEDING. By R. H. Dennett. 8vo, 2nd ed. *Lippincott* Net 21s.

DENTISTRY.

- DENTAL PATHOLOGY. By J. Endelman and A. F. Wagner. Roy. 8vo, pp. 593.
Kimpton Net 42s.
- DENTISTRY. By B. Underwood. *Churchill* Net 9s. 6d.
- ESSENTIALS OF OPERATIVE DENTISTRY. By W. C. Davis. 3rd ed. 8vo. *Kimpton*
 Net 21s.
- HANDBOOK OF MECHANICAL DENTISTRY. By J. L. D. Buxton. 8vo. *Churchill*
 Net 16s.
- MANUAL OF DENTAL METALLURGY. By E. A. Smith. 4th ed. Cr. 8vo. *Churchill*
 Net 12s. 6d.

- MANUAL OF DENTAL PROSTHETICS. By G. H. Wilson. 4th ed. Demy 8vo, pp. 600. *Kimpton* Net 30s.
 ORAL ANÆSTHESIA. By K. H. Thoma. 2nd ed. 8vo, pp. 185. *Kimpton* Net 25s.
 PERIODONTAL DISEASE AND ITS TREATMENT BY IONIC MEDICATION. By E. Sturridge. Demy 8vo, pp. 139. *Kimpton* Net 10s. 6d.
 PRACTICAL ORTHODONTIA. By M. Dewey. 4th ed. 8vo. *Kimpton* Net 32s.
 PRACTICAL TREATISE ON ARTIFICIAL CROWN, BRIDGE, AND PORCELAIN WORK. By G. EVANS. Roy. 8vo, pp. 593. 8th ed. *Kimpton* Net 45s.
 PRINCIPLES AND PRACTICE OF OPERATIVE DENTISTRY. By J. S. Marshall. 5th ed. *Lippincott* Net 35s.
 PYORRHEA ALVEOLARIS IN ITS CLINICAL ASPECT. By D. A. Crow. Cr. 8vo, pp. 128. *Baillière* Net 5s.
 SYNOPSIS OF DENTISTRY. By B. Underwood. *Churchill* Net 9s. 6d.
 TEXT-BOOK OF OPERATIVE DENTISTRY. Edited by M. L. Ward. 5th ed. Roy. 8vo. pp. 768. *Kimpton* Net 63s.

EAR, NOSE, AND THROAT.

- ADENOIDS AND ENLARGED TONSILS CURABLE WITHOUT OPERATION. By J. Kynaston. Cr. 8vo, pp. 39. *St. Catherine Press* Net 1s.
 CATARRHAL AND SUPPURATIVE DISEASES OF THE ACCESSORY SINUSES OF THE NOSE. By R. H. Skillern. 3rd ed. *Lippincott* Net 30s.
 DISEASES OF THE THROAT, NOSE, AND EAR. By D. McKenzie. Roy. 8vo. *Heinemann* Net 42s.
 HANDBOOK OF DISEASES OF THE NOSE, THROAT, AND EAR. By W. S. Syme. Cr. 8vo, pp. 320. *Livingstone* Net 9s.
 OTO-RHINO-LARYNGOLOGY. For the Student and Practitioner. By G. Laurens. Translated by H. Clayton Fox. 8vo, illustrated, pp. 350. *Wright* Net 17s. 6d.
 TEXT-BOOK OF TRACHEO-BRONCHOSCOPY. (Technical and Practical.) By M. Mann. Translated by A. R. Moodie. Roy. 8vo, pp. 292. *Bale* Net 31s. 6d.

ELECTRICITY, RADIOTHERAPY, AND PHYSICAL METHODS.

- AIDS TO ELECTRO-THERAPEUTICS. By J. M. Redding. 18mo, pp. 204. *Baillière* Net 5s.
 ATLAS OF ELECTRO-DIAGNOSIS AND THERAPEUTICS. By F. M. de Laroquette. Translation by Mary G. Cheetham. 8vo, pp. 196. *Baillière* Net 15s.
 COOLIDGE TUBE (THE). By H. Pilon. Cr. 8vo, pp. 104. *Baillière* Net 7s. 6d.
 DIATHERMY IN MEDICAL AND SURGICAL PRACTICE. By C. Saberton. Cr. 8vo, pp. 150. *Cassell* Net 7s. 6d.
 ELECTRIC IONIZATION: A Practical Introduction to its Use in Medicine and Surgery. By A. R. Friel. 8vo. *Wright* Net 6s. Paper; 8s. Cloth.
 ELECTRO-THERAPY: Its Rationale and Indications. By J. C. Webb. Cr. 8vo. *Churchill* Net 5s.
 HOME EXERCISES FOR SPINAL CURVATURES. By R. Timberg. Cr. 8vo, pp. 79. *Heinemann* Net 6s.
 MASSAGE: ITS PRINCIPLES AND PRACTICE. By J. B. Mennell. 2nd ed. *Churchill* Net 21s.
 MASSAGE AND MEDICAL GYMNASTICS (Kleen's). Translated by M. L. Dobbie. 2nd ed. *Churchill* Net 32s.
 MEDICAL ELECTRICITY. By H. L. Jones. Revised by L. W. Bathurst. 8th ed., pp. 500. *Lewis* Net 22s. 6d.
 MEDICAL GYMNASTICS IN MEDICINE AND SURGERY. By E. B. Clayton. Cr. 8vo. *Arnold* Net 5s.
 PRINCIPLES AND PRACTICE OF ROENTGENOLOGICAL TECHNIQUE. By I. S. Hirsch. 4to. *Lewis* Net 60s.
 RADIOGRAPHY OF THE CHEST. By W. Overend. Vol. I.—Pulmonary Tuberculosis. 8vo, pp. 130. *Heinemann* Net 17s. 6d.
 SYSTEMATIC DEVELOPMENT OF X-RAY PLATES AND FILMS. By I. Wendell. 8vo. *Kimpton* Net 12s.
 TEXT-BOOK OF MASSAGE AND REMEDIAL GYMNASTICS. By L. L. Despard. Pp. 413. *Oxford Medical Publications* Net 26s.
 THEORY AND PRACTICE OF MASSAGE. By B. M. Copestake. 3rd ed., 8vo, pp. 290. *Lewis* Net 12s. 6d.
 UNITED STATES ARMY X-RAY MANUAL. Authorized by the Surgeon-General of the Army. 8vo, pp. 506. *Lewis* Net 20s.
 X-RAY ATLAS OF THE SYSTEMATIC ARTERIES OF THE BODY. By H. C. Orrin. 4to, pp. 100. *Baillière* Net 12s. 6d.

EYE.

- AMERICAN ENCYCLOPÆDIA AND DICTIONARY OF OPHTHALMOLOGY. Edited by C. A. Wood. About 20 Roy. 8vo vols. of 800 pp. each. In Sets only. Vol. XVI. *Kimpton*
Net each 60s.
- CARD TEST FOR COLOUR BLINDNESS. By F. W. E. Green. Cr. 8vo, leather case. *Bell*
Net 25s.
- CLINICAL OPHTHALMOLOGY FOR THE GENERAL PRACTITIONER. By A. M. Ramsay. Roy. 8vo, pp. 520. *Oxford Medical Publications*
Net 42s.
- DISEASES OF THE EYE. By M. S. Mayou. Cr. 8vo, pp. 342. *Oxford Medical Publications*
Net 10s. 6d.
- MANUAL OF OPHTHALMIC OPERATIONS. By F. P. Maynard. Roy. 8vo, pp. 267. 2nd ed. *Livingstone*
Net 21s.
- MANUAL OF OPHTHALMIC PRACTICE. By F. P. Maynard. Roy. 8vo, pp. 337. *Livingstone*
Net 25s.
- OPHTHALMOLOGY. By L. W. Fox. 2nd ed., revised. Pp. 831. *Appleton*
Net 45s.
- PHYSIOLOGY OF VISION. With Special Reference to Colour Blindness. By F. W. E. Green. 8vo, pp. 292. *Bell*
Net 12s.
- POCKET BOOK OF OPHTHALMOLOGY. By A. J. Ballantyne. Cr. 8vo, pp. 120. *Livingstone*
Net 5s. 6d.
- SIGHT-TESTING MADE EASY. By W. W. Hardwicke. 4th ed. *Churchill*
Net 5s.
- TEXT-BOOK OF OPHTHALMIC OPERATIONS. By H. Grimsdale and E. Brewerton. 2nd ed. 8vo, pp. 445. *Baillière*
Net 21s.

FEVERS, SPECIFIC INFECTIONS, AND TROPICAL DISEASES.

- CIRCULATORY FAILURE OF DIPHTHERIA. By M. E. Harding. 8vo. *Oxford Medical Publications*
Net 10s. 6d.
- ESSENTIALS OF TROPICAL MEDICINE. By W. E. Masters. Roy. 8vo, pp. 710. *Bale*
Net 42s.
- INFECTIOUS DISEASES. A Practical Text-book. By C. B. Ker. Roy. 8vo, pp. 639. *Oxford Medical Publications*
Net 42s.
- KALA-AZAR. By R. B. U. Brahmachari. 2nd ed., pp. 258. *Butterworth*
Net Rs. 7
- MALARIA AT HOME AND ABROAD. By S. P. James. Cr. 4to, pp. 245. *Bale*
Net 25s.
- MEDICAL GUIDE FOR INDIA, AND BOOK OF PRESCRIPTIONS. By E. J. O'Meara. Pp. 724. *Butterworth*
Net Rs. 12
- MEDICO-TROPICAL PRACTICE. By G. E. Brooke. A Handbook for Medical Practitioners and Students. 18mo, pp. 522. *Griffin*
Net 18s.
- PELLAGRA. By H. F. Harris. 8vo. Illustrated. *Macmillan*
Net 26s.
- SERBIAN EPIDEMICS OF TYPHUS AND RELAPSING FEVER IN 1915. By W. Hunter. Roy. 8vo. *Bale*
Net 7s. 6d.
- TROPICAL OPHTHALMOLOGY. By R. H. Elliot. 8vo, pp. 548. *Oxford Medical Publications*
Net 31s. 6d.
- WAR AGAINST TROPICAL DISEASE. By A. Balfour. Roy. 8vo, pp. 220. *Baillière*
Net 12s. 6d.

HYGIENE, PUBLIC HEALTH, AND MEDICAL JURISPRUDENCE.

- AIDS TO SANITARY SCIENCE. By F. J. Allen. For the Use of Candidates for Public Health Qualifications. 2nd ed. Revised by R. A. Farrar. 18mo, pp. 280. *Baillière*
Net 4s. 6d.
- COOKERY FOR DYSPEPTICS. By G. Herschell. 8vo, pp. 56. *Arnold*
Net 2s. 6d.
- DIABETIC DIETING AND COOKERY. By P. J. Cammidge. 8vo, pp. 230. *Univ. Lond. Press*
Net 10s. 6d.
- DIETS AND ARTICLES OF FOOD SUITABLE FOR DIABETIC PATIENTS. By R. T. Williamson. Roy. 8vo, pp. 35. *Sherratt & Hughes*
Net 2s. 6d.
- ELEMENTS OF HYGIENE AND PUBLIC HEALTH. By J. P. Modi. pp. 497. *Butterworth*
Net Rs. 6s.
- FALL OF THE BIRTH-RATE. By G. U. Yule. Demy 8vo, pp. 44. *Cambridge Univ. Press*
Net 4s.
- FOOD POISONING AND FOOD INFECTIONS. By W. G. Savage. 8vo, pp. 256. *Camb. Univ. Press*
Net 15s.
- HANDBOOK ON HEALTH AND HOW TO KEEP IT. By W. Camp. Cr. 8vo, pp. 210. *Appleton*
6s.
- HEALTHFUL LIVING. By J. F. Williams. Cr. 8vo. Illustrated. *Macmillan*
Net 6s. 6d.
- HYGIENE: DENTAL AND GENERAL. By C. E. Turner. Roy. 8vo, pp. 400. *Kimpton*
Net 24s.

- HYGIENE AND PUBLIC HEALTH. By L. C. Parkes and H. R. Kenwood. 6th ed., revised. 8vo, pp. 793. *Lewis* Net 22s. 6d.
- INDUSTRIAL CLINIC. A Handbook dealing with Health in Work, by several writers. Edited by E. L. Collis. 8vo, pp. 260. *Bale* Net 10s. 6d.
- INDUSTRIAL COLONIES AND VILLAGE SETTLEMENTS FOR THE CONSUMPTIVE. By Sir G. Woodhead and P. C. Vartier-Jones. Demy 8vo, pp. 164. *Cambridge Univ. Press* Net 10s. 6d.
- INFANT EDUCATION. By E. Pritchard. 2nd ed. Cr. 8vo, pp. 242. *Kimpton* Net 6s.
- MANUAL OF HYGIENE FOR NURSES AND STUDENTS. By J. Glaister. 3rd ed. Cr. 8vo, pp. 440. *Livingstone* Net 10s. 6d.
- MARINE HYGIENE AND SANITATION. By G. E. Brooke. A Manual for Ships' Surgeons and Port Health Officers. 8vo, pp. 418. *Baillière* Net 15s.
- MEAT AND FOOD INSPECTION. By W. Robertson. 8vo, pp. 306. *Baillière* Net 18s.
- MENTAL HYGIENE OF CHILDHOOD. By W. A. White. Cr. 8vo, pp. 208. *Heinemann* Net 6s.
- MILITARY SANITATION. By Col. R. J. Blackham. 3rd ed., revised. Demy 8vo, pp. 148. *Bale* Net 10s. 6d.
- MODERN SANITARY ENGINEERING. By G. Thomson. Part 1.—House Drainage. 2nd ed., 8vo. *Constable* Net 16s.
- ORGANIZATION OF PUBLIC HEALTH NURSING. By A. M. Brainard. Cr. 8vo. *Macmillan* Net 7s. 6d.
- PERSONAL HYGIENE. By H. R. Samey. Pp. 104. *Butterworth* Net Rs. 3.
- POISONS, THEIR EFFECTS AND DETECTION. By A. W. and M. W. Blyth. 5th ed., revised. *Griiffn* Net 36s.
- PRACTICAL TROPICAL SANITATION. By E. P. Minett. A Pocket Book for Sanitary Inspectors in the Tropics. Cr. 8vo, pp. 130. *Baillière* Net 4s. 6d.
- PREVENTION AND DESTRUCTION OF RATS. By E. B. Dewberry. Demy 8vo, pp. 47. Illus. *Bale* Net 2s.
- PRINCIPLES AND PRACTICE OF MEDICAL JURISPRUDENCE (Taylor's). Edited by F. J. Smith. 7th ed. Two Vols. *Churchill* Net 63s.
- PRINCIPLES OF PREVENTIVE MEDICINE. By R. T. Hewlett and A. T. Nankivell. 8vo. *Churchill* Net 21s.
- PUBLIC HEALTH AND CHEMICAL ANALYSIS. By A. Foster and R. C. Frederick. *Constable* Net 21s.
- PUBLIC HEALTH LABORATORY WORK. By H. R. Kenwood. 7th ed., 8vo. *Lewis* Net 15s.
- SANITARY LAW. By B. Ham. 8th ed., revised by H. R. Kenwood. Fcap. 8vo. *Lewis* Net 5s.
- SANITARY LAW. By C. Porter. For the use of Students of Public Health. Cr. 8vo, pp. 180. *Longmans* Net 6s. 6d.
- SANITATION FOR PUBLIC HEALTH NURSES. By H. W. Hill. Cr. 8vo. *Macmillan* Net 7s.
- SCHOOL HYGIENE AND THE LAWS OF HEALTH. By C. Porter. New ed., pp. 361. 7 $\frac{1}{4}$ x 4 $\frac{3}{4}$. *Longmans* Net 6s. 6d.
- SYNOPSIS OF HYGIENE. By W. W. Jameson and F. T. Marchant. *Churchill* Net 18s.
- TEXT-BOOK OF FORENSIC MEDICINE AND TOXICOLOGY. By R. J. M. Buchanan. 8th ed., revised. 8vo, pp. 428. *Livingstone* Net 10s.
- TEXT-BOOK OF MEDICAL JURISPRUDENCE AND TOXICOLOGY. By J. P. Modi. Pp. 725. *Butterworth* Net Rs. 10.
- TEXT-BOOK OF PUBLIC HEALTH (HUSBAND'S). By E. W. Hope. 8th ed., revised. 8vo, pp. 277. *Livingstone* Net 8s. 6d.

LUNGS AND HEART.

- ADVICE TO CONSUMPTIVES. Home Treatment, After-Care, and Prevention. By N. D. Bardswell. 2nd ed. Cr. 8vo, pp. 169. *Black* Net 3s. 6d.
- ANTI-TUBERCULOSIS RECONSTRUCTION. By D. P. H. Cr. 8vo. *Allen & Unwin* Net 6d.
- ARTERIOSCLEROSIS AND HYPERTENSION. By L. M. Warfield. With chapters on Blood Pressure. 3rd ed. Roy. 8vo, pp. 265. *Kimpton* Net 24s.
- CHART OF THE ARTERIAL SYSTEM. (Head and Neck and Upper Extremity). 18mo. *Bryce* 1s. 6d.
- DISEASES OF THE LUNGS AND PLEURÆ. Including Tuberculosis and Mediastinal Growths. By Sir R. D. Powell and P. H. S. Hartley. 6th ed., demy 8vo. *Lewis* Net 42s.
- HANDBOOK FOR TUBERCULOSIS WORKERS. By N. Bardswell. 18mo, pp. 70. *Bale* Net 1s. 6d.
- MECHANISM AND GRAPHIC REGISTRATION OF THE HEART BEAT. By T. Lewis. Roy. 8vo. *Shaw & Sons* Net 47s. 6d.

- ORIGINAL OBSERVATIONS AND THEORIES ON CARDIAC DISEASE AND THE NORMAL HEART.
By M. B. Shipsey. With a Note on Alcohol. Cr. 8vo, pp. 40. *Cornish* Net 1s. 3d.
PHYSICAL SIGNS IN THE CHEST AND ABDOMEN. By A. J. Jex-Blake. 8vo. *Churchill*.
Net 9s. 6d.
SHIBBOLETHS OF TUBERCULOSIS. By M. Paterson. 8vo, pp. 239. *Murray* Net 10s. 6d.
TUBERCULOSIS. By G. N. Meachen. A Manual for Tuberculosis Nurses, Health
Visitors, and other workers. 18mo, pp. 124. *Scientific Press* Net 1s. 3d.
TUBERCULOSIS IN INDIA. With special reference to Social Problems. *Butterworth*
Net Rs. 7.8

MATERIA MEDICA, PHARMACY, AND THERAPEUTICS.

- ALCOHOL AND THE HUMAN BODY. By Sir V. Horsley and M. D. Sturge. 6th ed. Cr.
8vo, pp. 375. *Macmillan* Net 3s.
ANÆSTHETICS: THEIR USES AND ADMINISTRATION. By D. W. Buxton. 6th ed. 8vo,
pp. 562. *Lewis* Net 21s.
BACKWATERS OF LETHE. (Some Anæsthetic Notions.) By G. A. H. Barton. Cr.
8vo, pp. 158. *Lewis* Net 5s.
BLOCK ANÆSTHESIA AND ALLIED SUBJECTS. By A. E. Smith. 8vo, pp. 930. *Kimpton*
Net 90s.
EPITOME OF THE HOMŒOPATHIC DOMESTIC MEDICINE. By J. Laurie. Cr. 8vo, pp.
635. *Homœopathic Pub. Co.* Net 9s.
EXTRA PHARMACOPŒIA. By W. H. Martindale and W. W. Westcott. 17th ed. Vol.
I. Fcap. 8vo. *Lewis* Net 27s.
MATERIA MEDICA. 3 Parts. 3rd ed. 'Catechism Series'. *Livingstone*
Each net 1s. 9d.
MATERIA MEDICA, PHARMACY, PHARMACOLOGY AND THERAPEUTICS. By Sir W. Hale.
White. 17th ed. *Churchill* Net 10s. 6d.
MATERIAL MNEMONICS. Aids to Materia Medica. By M. C. Anderson. Cr. 8vo,
pp. 64. *Bryce* Net 6d.
NEW FAMILY HERBAL. By M. Robinson. Comprising a Description and the Medical
Virtues of British and Foreign Plants. 18mo, pp. 480. *Nicholson*. Net 4s.; 5s.
PHARMACEUTICAL POCKET BOOK FOR PRACTITIONERS AND STUDENTS. 9th ed. 18mo,
pp. 360. *Pharmaceutical Press* Net 3s. 6d.
PHARMACOPŒIA OF THE QUEEN'S HOSPITAL FOR CHILDREN, BETHNAL GREEN. 16mo.
Lewis Net 4s. 6d.
PSYCHOLOGICAL TABLES. By W. Craig. 5th ed. *Livingstone* Net 1s. 6d.
PRACTICAL PHARMACOLOGY. By W. E. Dixon. For the use of Students of Medicine.
8vo, pp. 88. *Cambridge University Press* Net 7s. 6d.
SYNOPSIS OF PHARMACOLOGY. By D. Cow. Cr. 8vo. *Churchill* Net 7s. 6d.
TEXT-BOOK OF MATERIA MEDICA. By Prof. H. G. Greenish. 3rd ed. 8vo. *Churchill*
Net 27s.
TEXT-BOOK OF PHARMACOLOGY AND MEDICAL TREATMENT FOR NURSES. By J. M. F.
Brickdale. Roy. 8vo. *Oxford University Press* Net 25s.
TREATISE ON MATERIA MEDICA AND THERAPEUTICS. 8th ed. By B. H. Deare and
B. N. Ghosh. 8vo, pp. 710. *Hilton* Net 9s. 6d.

MEDICINE, GENERAL.

- ÆQUANIMITAS. With Other Addresses to Medical Students, Nurses, and Practitioners
of Medicine. By Sir W. Osler. 8vo, pp. 485. *Lewis* Net 10s.
ASSESSMENT OF PHYSICAL FITNESS. By G. Dreyer and G. F. Hanson. 8vo, pp. 155.
Cassell Net 10s.
CLINICAL METHODS. A Guide to the Practical Study of Medicine. By R. Hutchison
and H. Rainy. 7th ed. 18mo, pp. 700. *Cassell* Net 12s. 6d.
DOCTOR'S MANUAL. By A. H. Hart. 8vo, pp. 272. *Bale* Net 10s. 6d.
ELEMENTS OF PRACTICAL MEDICINE. By A. H. Carter. Revised by A. G. Gibson.
11th ed. Cr. 8vo, pp. 713. *Lewis* Net 16s.
EXOPHTHALMIC GOITRE AND ITS NON-SURGICAL TREATMENT. By I. Bram. pp. 438.
Kimpton Net 32s.
FAMILY MEDICINE AND HYGIENE FOR INDIA. By Sir W. J. Moore and C. A. Sprawson.
8th ed. *Churchill* Net 10s. 6d.
GOUT: Its Etiology, Pathology, Course, and Treatment. By L. J. Llewellyn. Roy.
8vo. *Heinemann* Net 30s.
INDEX OF SYMPTOMS, WITH DIAGNOSTIC METHODS. By R. W. Leftwich. 7th ed.
Revised by H. N. W. Collins. *Murray* Net 15s.
MANUAL OF MEDICINE. By A. S. Woodwark. Cr. 8vo, pp. 500. *Oxford Medical*
Publications Net 16s.

- MEDICINE AND THE ALLIED SCIENCES. By S. Fomon. Three vols., illus. *Appleton*
Net 125s.
- OBESITY: ITS TREATMENT. By T. Dutton. 2nd ed. Cr. 8vo, pp. 48. *Kimpton.*
Net 2s. 6d.
- PAIN. By R. J. Behan. Pp. 920. New ed. *Appleton* - - - *Net 42s.*
- PHYSICAL DIAGNOSIS. By R. C. Cabot. Roy. 8vo, pp. 548. *Baillière* *Net 24s.*
- PHYSIOLOGY OF GOUT, RHEUMATISM, AND ARTHRITIS, as a Basis of Efficient Treatment. By Percy Wilde. Fully illustrated. *Wright* - *Ready shortly*
- PRINCIPLES AND PRACTICE OF MEDICINE. By W. Osler and T. McCrae. 9th ed., revised. *Appleton* - - - *Net 35s.*
- RHEUMATISM AND ARTHRITIS. By R. Stockman. Folio, pp. 140. *Green* *Net 15s.*
- SYMPTOMS IN THE DIAGNOSIS OF DISEASE. By H. A. Hare. 8vo, pp. 562. *Kimpton*
Net 36s.
- SYNOPSIS OF MEDICINE. By H. Letheby Tidy. Cr. 8vo, pp. 967. *Wright* *Net 25s.*
- WHEELER'S HANDBOOK OF MEDICINE. By W. R. Jack. 6th ed. Cr. 8vo, pp. 561. *Livingstone* - - - *12s. 6d.*
- WILSON AND POTTER'S INTERNAL MEDICINE. Three 8vo Vols. *Lippincott* *Net 90s.*

MIDWIFERY AND DISEASES OF WOMEN.

- DIFFICULT LABOUR (HERMAN'S). A Guide for Students and Practitioners. 6th ed., revised by C. Oldfield. Cr. 8vo, pp. 573. *Cassell* - - - *Net 16s.*
- DIFFICULTIES AND EMERGENCIES OF OBSTETRIC PRACTICE. By C. Berkeley and V. Bonney. 3rd ed. 8vo. *Churchill* - - - *Net 42s.*
- FIRST LESSONS IN MIDWIFERY FOR COUNTRY DAIS IN INDIA. By M. I. Balfour. Pp. 41. *Butterworth* - - - *Net 4s. 8*
- GYNÆCOLOGY. By Eden and Lockyer. 2nd ed. *Churchill.* - - - *Net 42s.*
- HANDBOOK FOR MIDWIVES AND MATERNITY NURSES. By W. E. Fothergill. 8vo, pp. 288. *Green* - - - *Net 10s.*
- HANDBOOK OF MIDWIFERY. By C. Berkeley. 5th ed. *Cassell* - - - *Net 7s. 6d.*
- INTRODUCTION TO MIDWIFERY: A Handbook for Medical Students and Midwives. By A. Donald. Cr. 8vo, pp. 192. *Griffin* - - - *Net 6s.*
- MANUAL FOR MIDWIVES. By C. N. Longridge and J. B. Bannister. 3rd ed. Cr. 8vo, pp. 346. *Churchill* - - - *Net 7s. 6d.*
- MANUAL OF OBSTETRICS. By O. St. J. Moses. 8vo. *Churchill* - - - *Net 21s.*
- MIDWIFE'S POCKET BOOK (THE). With which is Incorporated the Midwife's Pocket Encyclopædia. 7th ed. 18mo, pp. 188. *Scientific Press* - - - *Net 1s. 3d.*
- MIDWIFERY. By Ten Teachers. Under the Direction of Comyns Berkeley. 8vo. *Arnold* - - - *Net 30s.*
- MIDWIFERY FOR NURSES. By H. R. Andrews. 5th ed. Cr. 8vo, pp. 310. *Arnold*
Net 5s.
- MANUAL OF GYNÆCOLOGY. By S. J. Cameron. 2nd ed., revised. Roy. 8vo. *Harrap.*
Net 25s.
- OPERATIVE GYNÆCOLOGY. By H. S. Crossen. 2nd ed., revised, pp. 717. *Kimpton*
Net 63s.
- PAINLESS CHILDBIRTH. "An Improvement on Twilight Sleep." By C. H. Davis. Cr. 8vo, pp. 160. *Routledge* - - - *Net 3s. 6d.*
- PRACTICAL TEXT-BOOK OF MIDWIFERY FOR NURSES. By R. Jardine. 7th ed. Cr. 8vo, pp. 312. *Kimpton* - - - *Net 7s. 6d.*
- SHORT PRACTICE OF MIDWIFERY. By H. Jellett. 8th ed. Cr. 8vo, pp. 477. 5th ed., revised. *Churchill* - - - *Net 18s.*
- TEXT-BOOK OF MIDWIFERY. By R. W. Johnstone. 3rd ed. Cr. 8vo. *Black*
Net 12s. 6d.
- TUMOURS COMPLICATING PREGNANCY; LABOUR AND THE PUERPERIUM. By H. R. Spencer. Being the Lettsomian Lectures, February-March, 1920. 8vo. *Harrison*
Net 5s.

NERVOUS AND MENTAL DISEASES.

- ANXIETY HYSTERIA. Modern views on some neuroses. By C. H. L. Rixon and D. Matthew. Cr. 8vo. pp. 124. *Lewis* - - - *Net 4s. 6d.*
- BASIS OF PSYCHIATRY. By A. C. Buckley. 8vo. Illustrated. *Lippincott* *Net 21s.*
- COLLECTED PAPERS ON THE PSYCHOLOGY OF PHANTASY. By Constance E. Long. Pp. 240. *Baillière* - - - *Net 10s. 6d.*
- DIAGNOSIS AND TREATMENT OF BRAIN INJURIES. By W. Sharp. 8vo. *Lippincott*
Net 35s.
- FEEBLEMINDEDNESS IN CHILDREN OF SCHOOL AGE. With Appendix on Treatment and Training by Mary Dendy, M.A. By C. P. Lapage. Cr. 8vo, pp. 324. *Longmans*
Net 10s. 6d.

- FUNCTIONAL NERVE DISEASE. An Epitome of War Experience for the Practitioner.
 Edited by H. Crichton Miller. 8vo, pp. 219. *Oxford Medical Publications*
Net 8s. 6d.
- GROUP MIND (THE). By W. McDougall. Roy. 8vo, pp. 320. *Cambridge Univ. Press*
Net 21s.
- HUMAN ATMOSPHERE. (The Aura). By W. J. Kilner. 8vo, pp. 307. *Kegan Paul*
Net 10s. 6d.
- HYPNOTISM AND TREATMENT BY SUGGESTION. By A. E. Davis. Cr. 8vo, pp. 200.
Simpkin, Marshall
Net 5s.
- INJURIES OF THE PERIPHERAL NERVES. By H. S. Souttar and E. W. Twining. Folio,
 pp. 163. *Wright*
Net 18s. 6d.
- INSTINCT AND THE UNCONSCIOUS. A Contribution to a Biological Theory of the
 Psychoneuroses. By W. H. R. Rivers. 8vo, pp. 260. *Cambridge University Press*
Net 16s.
- INTRODUCTION TO THE STUDY OF HYPNOTISM, EXPERIMENTAL AND THERAPEUTIC.
 By H. E. Wingfield. 2nd ed. Cr. 8vo, pp. 204. *Baillière*
Net 7s. 6d.
- LOGIC OF THE UNCONSCIOUS MIND. By M. K. Bradhy. Pp. 330. *Oxford Medical Publications*
Net 16s.
- LUNACY IN INDIA. By A. W. Overbeck-Wright. Demy 8vo, pp. 417. *Baillière*
Net 21s.
- MANIC-DEPRESSIVE INSANITY AND PARANOIA. Translated by R. M. Barclay. Edited
 by Prof. G. M. Robertson. Demy 8vo, pp. 300. *Livingstone*
Net 21s.
- MANUAL OF NEURASTHENIA. (Nervous Exhaustion.) By I. G. Cobb. 8vo, pp. 366.
Baillière
Net 15s.
- MANUAL OF PSYCHIATRY. Edited by A. J. Rosanoff. 8vo. *Chapman & Hall*
Net 22s.
- MENTAL DEFICIENCY (AMENTIA). By A. F. Tredgold. 8vo, pp. 550. *Baillière* *Net 25s.*
- MENTAL LIMITATIONS OF THE EXPERT. By E. H. Hankin. *Butterworth* *Net Rs. 3.8*
- MENTAL TEST IN THE AMERICAN ARMY. Compiled and Edited by C. S. Yoakum and
 R. M. Yerkes. *Sidgwick & Jackson* *Net 6s.*
- MILITARY PSYCHIATRY IN PEACE AND WAR. By C. S. Read. 8vo, pp. 175. *Lewis*
Net 10s. 6d.
- NERVES AND THE MAN. By W. C. Loosmore. Cr. 8vo, pp. 223. *Murray* *Net 6s.*
- OUR NERVOUS FRIENDS. Illustrating the Mastery of Nervousness. By R. S. Carroll.
 Cr. 8vo. *Macmillan* *Net 12s.*
- PSYCHO-ANALYSIS: ITS HISTORY, THEORY, AND PRACTICE. By André Tridon. Pp.
 284. *Kegan Paul* *10s. 6d.*
- PSYCHOLOGY. From the Standpoint of a Behaviorist. By J. B. Watson. Pp. 429.
Lippincott *Net 10s. 6d.*
- PSYCHOLOGY OF FUNCTIONAL NEUROSES. By Hollingworth. Cr. 8vo, pp. 260.
Appleton *Net 10s. 6d.*
- PSYCHONEUROSES OF WAR AND PEACE. Thesis approved for the Degree of Doctrine
 of Medicine in the University of London. By M. Culpin. 8vo, pp. 128. *Cambridge University Press*
Net 10s.
- PSYCHOPATHOLOGY. By E. J. Kempf. 8vo, pp. 762. *Kimpton* *Net 63s.*
- PSYCHOPATHOLOGY OF EVERYDAY LIFE. By S. Freud. Authorized English edition,
 With introduction by A. A. Brill. 8vo, pp. 342. *Unwin* *Net 12s. 6d.*
- REST, SUGGESTION, AND OTHER THERAPEUTIC MEASURES IN NERVOUS AND MENTAL
 DISEASES. By F. X. Dercum. 8vo. *Kegan Paul* *Net 21s.*
- STUDIES IN NEUROLOGY. By H. Head and W. H. R. Rivers. 2 Vols. Folio, pp.
 338, 537. *Oxford Medical Publications* *Net 63s.*
- SYMPATHETIC NERVOUS SYSTEM IN DISEASE. By W. L. Brown. 8vo, pp. 172. *Oxford Medical Publications*
Net 10s. 6d.
- TREATMENT OF THE NEUROSES. By E. Jones. 8vo, pp. 241. *Baillière* *Net 10s. 6d.*

PATHOLOGY.

- AIDS TO PATHOLOGY. By H. Campbell. 4th ed. Fcap 8vo, pp. 255. *Baillière*
Net 4s. 6d.
- GENERAL AND DENTAL PATHOLOGY. By J. Endelman and A. F. Wagner. 8vo.
Kimpton *Net 32s.*
- SURGICAL PATHOLOGY AND MORBID ANATOMY. By Sir A. Bowlby and Sir F. W.
 Andrews. 7th ed. *Churchill* *Net 30s.*
- TEXT-BOOK OF PATHOLOGY. By F. Delafield and T. M. Prudden. Revised by F. C.
 Wood. 11th ed. Roy. 8vo, pp. 1360. *Bale* *Net 63s.*

SKIN AND VENEREAL DISEASES.

- ATLAS OF THE PRIMARY AND CUTANEOUS LESIONS OF ACQUIRED SYPHILIS IN THE MALE, with a foreword by Lieut.-Gen. Sir J. Goodwin. Demy 4to, pp. 32. *Bale* Net 27s. 6d.
COMMON DISEASES OF THE SKIN. By G. G. Campbell. 8vo. Illustrated. *Macmillan* Net 21s.
DISEASES OF THE SKIN. By J. M. H. Macleod. Roy. 8vo. *Lewis* - Net 70s.
DISEASES OF THE SKIN. By R. L. Sutton. 3rd ed. Roy. 8vo. *Kimpton* Net 42s.
GONOCOCCAL INFECTION IN THE MALE. By N. Lumb. For Students and Practitioners. Illustrated. 8vo, pp. 339. *Bale* - Net 25s.
INTRODUCTION TO DERMATOLOGY. By N. Walker and R. C. Low. 8vo, pp. 380. *Green* - Net 20s.
MANUAL OF VENEREAL DISEASES FOR STUDENTS. By L. W. Harrison. Cr. 8vo, pp. 375. *Oxford Medical Publications* - Net 16s.
OCCUPATIONAL AFFECTIONS OF THE SKIN: Their Prevention and Treatment. By R. P. White. 2nd ed. 8vo, pp. 374. *Lewis* - Net 25s.
PREVENTION OF VENEREAL DISEASE. By Sir A. Reid. With an Introductory Chapter, by Sir B. Donkin. Cr. 8vo, pp. 465. *Heinemann* - Net 15s.
SYPHILIS. By H. H. Hazen. 8vo. *Kimpton* - Net 36s.
SYPHILIS AND ITS TREATMENT. With especial reference to Syphilis of the Skin. By W. S. Fox. Roy. 8vo. *Lewis* - Net 36s.
SYPHILIS AND VENEREAL DISEASE, FOR STUDENTS AND PRACTITIONERS. By C. F. Marshall and E. G. French. 4th ed. Demy 8vo, pp. 443. Illustrated. *Baillière* Net 25s.
SYPHILIS IN CHILDHOOD. By L. Findlay. Cr. 8vo, pp. 166. *Oxford Medical Publications* - Net 8s. 6d.
SYPHILIS IN GENERAL PRACTICE. With special reference to the Tropics. By K. K. Chatterji. Pp. 382. *Butterworth* - Net Rs. 15s.
SYSTEMATIC TREATMENT OF GONORRHEA. By N. Lumb. 2nd ed. Cr. 8vo, pp. 132. *Lewis* - Net 5s.
TREATMENT OF SYPHILIS. By H. S. Baketal. 8vo. Illustrated. *Macmillan*. Net 13s.
VENEREAL DISEASE AND ITS PREVENTION. By R. Leblanc. Cr. 8vo, pp. 158. *Browne* Net 7s. 6d.
VENEREAL DISEASES: Their Clinical Aspect and Treatment. By J. E. R. McDonagh. 106 Colour and 21 Half-tone Illustrations. Cr. 8vo, pp. 419. *Heinemann*. Net 63s.

SURGERY.

- AFTER-TREATMENT OF SURGICAL PATIENTS. By W. Bartlett. 2 Vols. 8vo. *Kimpton* Net 60s.
ANIMAL EXPERIMENTS AND SURGERY. Hunterian Lectures. By W. G. Spencer. Cr. 8vo, pp. 187. *Univ. Lond. Press* - Net 6s.
BRADSHAW LECTURE ON THE SURGERY OF THE HEART, delivered before the R.C.S., Dec. 11, 1919. By Sir C. A. Ballance. 8vo, pp. 154. *Macmillan* Net 10s. 6d.
CONSULTING SURGEON IN THE NEAR EAST. By Lt.-Col. A. H. Tubby. Pp. 292. *Christophers* - 15s.
COURSE OF OPERATIVE SURGERY. By Prof. V. Schmieden and A. Turnbull. 2nd ed. Roy. 8vo, pp. 370. *Baillière* - Net 25s.
EARLY HISTORY OF SURGERY IN GREAT BRITAIN. Its Organization and Development. By G. Parker. Cr. 8vo, pp. 213. *Black* - Net 7s. 6d.
ESSAYS ON THE SURGERY OF THE TEMPORAL BONE. By Sir C. A. Ballance, assisted by C. D. Green. 2 Vols. Illustrated. Demy 4to. *Macmillan* - Net 105s.
HANDBOOK OF DISEASES OF THE RECTUM. By L. J. Hirschman. 3rd ed., 8vo, pp. 378. *Kimpton* - Net 30s.
INJURIES TO JOINTS. By Col. Sir R. Jones. 2nd ed. 'Oxford War Primers'. 18mo, pp. 195. *Oxford Medical Publications* - Net 6s.
MANUAL OF SURGERY FOR STUDENTS AND PRACTITIONERS. By W. Rose and A. R. Carless. 10th ed. Demy 8vo, pp. 1572. *Baillière* - Net 30s.
MANUAL OF WAR SURGERY. By Col. S. Barling and Maj. J. T. Morrison. With an Introduction by Maj.-Gen. Sir G. H. Makins. 8vo, pp. 495. *Oxford Medical Publications* - Net 21s.
MIS-SHAPEN NOSES, AND THEIR SURGICAL CORRECTION WITHOUT CICAATRIX. By J. Bourguet. Roy. 8vo, pp. 72. *Baillière* - Net 3s.
OPERATIVE SURGERY. By A. Thomson and A. Miles. Cr. 8vo, pp. 637. *Oxford Medical Publications* - Net 16s.
OPERATIVE SURGERY. By C. R. Whittaker. Cr. 8vo, pp. 222. *Livingstone* Net 5s. 6d.

- OPERATIVE SURGERY. 3 Parts. 2nd ed. 'Catechism Series'. *Livingstone*
Each net 1s. 9d.
- ORTHOPÆDICS FOR PRACTITIONERS. An Introduction to the Practical Treatment of the Common Deformities. By P. B. Roth. 8vo, pp. 207. *Arnold* *Net 10s. 6d.*
- PLASTIC SURGERY OF THE FACE. By H. D. Gillies. Based on Select Cases of War Injuries of the Face, including Burns. With chapter on "The Prosthetic Problems of Plastic Surgery", by Capt. W. K. Fry, and "Remarks on Anæsthesia", by Capt. R. Wade. Folio, pp. 421. *Oxford Medical Publications* *Net 63s.*
- PRACTICE OF SURGERY. By R. Howard. Roy. 8vo, pp. 1251. *Arnold* *Net 35s.*
- PRACTICAL HINTS ON MINOR OPERATIONS. By G. P. Mills. 18mo, pp. 111. *Cornish*
Net 5s.
- SURGERY: A Text-book by Various Authors. Edited by G. E. Gask and H. W. Wilson. Roy. 8vo. *Churchill* *Net 42s.*
- SURGICAL THERAPEUTICS AND OPERATIVE TECHNIQUE. By E. Doyen, in collaboration with H. Spencer-Browne. In 3 Vols. Large 8vo. *Baillière*. *Net 100s.*
- SYNOPSIS OF SURGERY. By E. W. Hey Groves. Illustrated. 5th ed. Cr. 8vo, pp. 628. *Wright* *Net 17s. 6d.*
- SYNOPSIS OF SURGERY. By I. Back and A. T. Edwards. *Churchill* *Net 15s.*
- WOMEN AS ARMY SURGEONS. By Flora Murray, C.B.E. Pp. 179. *Oxford Medical Publications* *Net 12s. 6d.*

URINARY DISEASES.

- CLINICAL LECTURES ON THE ENLARGEMENT OF THE PROSTATE. By Sir P. J. Freyer. 5th ed. Demy 8vo, pp. 182. *Baillière* *Net 10s. 6d.*
- COMMON INFECTIONS OF THE KIDNEYS. By F. Kidd. With an additional Lecture on the Bacteriology of the Urine by P. Pantan. 8vo, pp. 351. *Oxford Medical Publications* *Net 18s.*
- GENITO-URINARY SURGERY AND VENEREAL DISEASES. By E. Martin, B. A. Thomas, and S. W. Moorhead. 12th ed., revised. 8vo, pp. 929. *Lippincott* *Net 35s.*

MISCELLANEOUS.

- AIR SICKNESS: Its Nature and Treatment. By R. Cruchet and R. Moulinier. Cr. 8vo, pp. 112. *Bale* *Net 5s.*
- BOTANY. 2 Parts. 3rd ed. 'Catechism Series'. *Livingstone* *Each net 1s. 9d.*
- CHAVASSE'S ADVICE TO A MOTHER. Re-written by T. D. Lister. 18th ed. Cr. 8vo, pp. 350. *Churchill* *Net 2s. 6d.*
- COLLECTED STUDIES ON THE PATHOLOGY OF WAR GAS POISONING. Under the direction of C. Winternitz. 4to. *Oxford University Press* *Net 84s.*
- EARLY ENGLISH MAGIC AND MEDICINE. By C. Singer. 8vo. *Oxford University Press* *Net 4s.*
- FUNDAMENTALS IN SEXUAL ETHICS. An Inquiry into Modern Tendencies. By S. Herbert. Cr. 8vo, pp. 350. *Black* *Net 12s. 6d.*
- HANDBOOK OF HEALTH. By W. Camp. F'cap 8vo, pp. 210. *Appleton* *Net 6s.*
- INBREEDING AND OUTBREEDING: Their Genetic and Sociological Significance. By E. M. East and D. F. Jones. *Lippincott* *Net 10s. 6d.*
- JUNIOR COURSE OF PRACTICAL ZOOLOGY. By A. M. Marshall and C. H. Hurst. Revised by F. W. Gamble. 9th ed. *Murray* *Net 12s.*
- MAN: PAST AND PRESENT. By A. H. Keane. Revised by A. H. Quiggin and A. C. Haddon. New ed., 8vo, pp. 594. *Cambridge Univ. Press* *Net 36s.*
- MEDICAL ANNUAL, 1920. A Year-Book of Treatment and Practitioner's Index. Thirty-eighth year. 8vo, pp. 639. *Wright* *Net 20s.*
- MEDICAL ASPECTS OF MUSTARD GAS POISONING. By A. S. Warthin and C. V. Weller. Roy. 8vo, pp. 267. *Kimpton* *Net 42s.*
- MEDICAL DIRECTORY, 1921. *Churchill* *Net 36s.*
- MEDICAL EXAMINATION OF AIRMEN. By Maublanc and Ratié. Translated by N. Ball. Cr. 8vo, pp. 96. *Bale* *Net 5s.*
- NARCOTIC DRUG PROBLEM. By E. S. Bishop. Cr. 8vo. *Macmillan* *Net 8s.*
- NURSES' COMPLETE MEDICAL DICTIONARY. Edited by C. M. Douthwaite. 18mo, pp. 206. *Baillière* *Net 3s.*
- OLD AT FORTY OR YOUNG AT SIXTY. Simplifying the Science of Growing Old. By R. S. Carroll. Cr. 8vo. *Macmillan* *Net 13s.*
- PERSONAL BEAUTY AND RACIAL BETTERMENT. By K. Dunlap. Cr. 8vo, pp. 95. *Kimpton* *Net 6s.*
- POCKET MEDICAL DICTIONARY. By G. M. Gould. 8th ed., 32 mo. *Lewis* *Net 9s.*

- QUICK REFERENCE BOOK FOR MEDICINE AND SURGERY. By G. E. Rehberger. 8vo. *Lippincott* - Net 63s.
- RADIANT MOTHERHOOD. A Book for Those who are Creating the Future. By M. C. Stopes. Cr. 8vo. pp. 246. *Putnams* - Net 6s.
- SELECTED LECTURES AND ESSAYS. Including Ligaments, their Nature and Morphology. By Sir J. Bland-Sutton. Demy 8vo, pp. 322. *Heinemann* - Net 15s.
- SEX COMPLEX: A Study of the Relationships of the Internal Secretions to the Female Characteristics and Functions in Health and Disease. By W. B. Bell. 2nd ed. Roy. 8vo, pp. 268. *Baillière* - Net 25s.
- SEXUAL DISABILITIES OF MAN, AND THEIR TREATMENT AND PREVENTION. By A. Cooper. 4th ed. Cr. 8vo, pp. 274. *Lewis* - Net 7s. 6d.
- SEXUAL LIFE. By C. W. Malchow. 8vo. *Kimpton* - Net 18s.
- SOCIAL DISEASES: Tuberculosis, Syphilis, Alcoholism, Sterility. By J. Hericourt. Translated, and with a Final Chapter by B. Miall. Cr. 8vo, pp. 246. *Routledge* - Net 7s. 6d.
- STERILE MARRIAGES. By J. Dulberg. Cr. 8vo, pp. 264. *Laurie* - Net 6s.
- STORY OF THE HORTON WAR HOSPITAL, EPSOM. By J. R. Lord. Demy 8vo, pp. 276. *Heinemann* - Net 12s. 6d.
- THE WIFE AND MOTHER: A Medical Guide. By A. Westland. Cr. 8vo, pp. 296. *Griffin* - Net 5s.
- ZOOLOGY. Parts 2 and 3. 2nd ed. 'Catechism Series'. *Livingstone*.
Each net 1s. 9d.

MEDICAL INSTITUTIONS, HOMES, SPAS, Etc.

We are very anxious to make this list complete, and to give all necessary information; but unless our circular of inquiry—which in every case is stamped for reply—is promptly returned, we cannot undertake the responsibility of inserting particulars of an Establishment which may have been closed.

INSTITUTIONS, HOSPITALS, AND LICENSED HOUSES FOR THE TREATMENT OF MENTAL DISEASES.

Aberdeen.—*Aberdeen City Mental Hospital.* Res. Med. Supt., H. de M. Alexander, M.D. Newmachar station, $1\frac{1}{2}$ miles.

Royal Asylum. Res. Med. Supt., R. Dods Brown, M.D.; Sec., A. S. Finnie, 343, Union Street. Aberdeen station, 1 mile.

Abergavenny.—*Monmouthshire Asylum.* Res. Med. Supt., N. R. Phillips, M.D. G.W.R. station, $\frac{1}{2}$ mile, L. & N.W., $\frac{3}{4}$ mile.

Antrim.—*District Asylum.* Res. Med. Supt., Dr. S. Graham. Antrim station, $1\frac{1}{2}$ miles.

Argyll and Bute.—*District Asylum,* Lochgilphead. Res. Med. Supt., Donald Ross, M.B., Ch.B. Rail to Gourrock, thence by steamer to Ardrishaig, $2\frac{1}{2}$ miles.

Arlesey (Bedfordshire).—*Three Counties Mental Hospital.* Res. Med. Supt., Dr. L. O. Fuller. Three Counties station, G.N.R., 1 mile. See also p. 91

Armagh.—*District Asylum.* Res. Med. Supt., Dr. Geo. R. Lawless. Armagh, $\frac{1}{2}$ mile.

The Retreat, Armagh.—Res. Med. Supt., Dr. J. Gower Allen, J.P. Richhill station, $1\frac{1}{2}$ miles, or Armagh station, 3 miles.

See also p. 86

Ayr.—*District Asylum,* Glengall. Med. Supt., G. Douglas McRae, M.D., F.R.C.P. Ayr station, 2 miles.

Ballinasloe (Co. Galway).—*District Lunatic Asylum.* Res. Med. Supt., John Mills, M.B.

Banff.—*District Asylum,* Ladysbridge. Res. Supt., J. Chisholm. Vis. Phys., Wm. Fergusson, M.D. Ladysbridge station.

Baschurch (Shropshire).—*Boreatton Park,* 10 miles from Shrewsbury. Res. Med. Supt., Dr. E. H. O. Sankey. Baschurch station, $2\frac{1}{2}$ miles. See also p. 88

Bath.—*Bailbrook House.* Res. Med. Supt., Norman Lavers, M.D. Bath, 10 minutes' drive. See also p. 93

Bedford.—*Bishopstone House* (for 18 ladies). Prop., Mrs. B. Peele. Med. Off., Dr. A. Chillingworth.

Springfield House Private Asylum, Bedford, 1 hour from London. Better class only received. Separate bedrooms. Terms from 5 guineas. Res. Med. Supts., David Bower, and Cedric W. Bower. Bedford, $1\frac{1}{2}$ miles, M.R. and L. & N.W.R. Tel. No. 17. See also p. 93

Belfast.—*Belfast District Lunatic Asylum.* Res. Med. Supt., Dr. S. J. Graham.

Beverley.—*East Riding of Yorkshire County Mental Hospital.* Res. Med. Supt., E. S. Simpson, M.C., M.D. Beverley station, 2 miles.

Birmingham.—*Birmingham City Asylum,* Rubery Hill. Res. Med. Supt., A. C. Suffer, M.D. Rubery station.

Birmingham City Mental Hospital, Winsion Green. Res. Med. Supt., Dr. C. B. Roscrow. Winsion Green, $\frac{1}{2}$ mile; Soho, $\frac{1}{2}$ mile.

Bodmin.—*Cornwall County Mental Hospital;* and *Carew Building,* a detached block for private patients. Res. Med. Supt., Dr. Francis Dudley. Bodmin station, G.W. and L.S.W. See also p. 95

Box (Wilts.).—*Kingsdown House,* 5 miles from Bath. Res. Med. Supt., Dr. H. C. MacBryan. See also p. 85

Brentwood.—*Essex Mental Hospital.* Res. Med. Supt., — — — — — . Brentwood station, $\frac{1}{2}$ mile.

Littleton Hall, Brentwood, Essex (for ladies). Med. Licensee, Dr. H. E. Haynes. Brentwood and Shenfield stations, $1\frac{1}{2}$ miles.

Bridgend.—*Glamorgan County Asylum.* Res. Med. Supt., D. Finlay, M.D. Bridgend, $1\frac{1}{2}$ miles.

Bristol.—*Bristolington House.* Proprietress, Mrs. Bonville Fox. Res. Physician, Dr. J. M. Rutherford. Bristol, 3 miles.

Bristol Mental Hospital, Fishponds. Res. Med. Supt., J. Vincent Blachford, M.D. Clerk and Steward, Arthur Orme, Fishponds station, 1 mile.

Northwoods House, Winterbourne, 7 miles from Bristol. Res. Med. Prop., J. D. Thomas, B.A., M.B., B.C. Taxicab from Bristol, Fishponds, Winterbourne, or Patchway stations. *See also p. 90*

Bromsgrove (Worcs.).—*Worcestershire Mental Hospital*, "Barnsley Hall". Res. Med. Supt., Dr. P. T. Hughes. Bromsgrove, M.R., $2\frac{1}{2}$ miles.

Burgess Hill (Sussex).—*St. George's Retreat*. Licensee, Miss Mary Slattery. Med. Supt., Dr. F. W. Apthorp. Wivelsfield, $1\frac{1}{2}$ miles; Burgess Hill station, 2 miles. *See also p. 94*

Burley-in-Wharfedale (Yorks.).—*West Riding Asylum*, Scalebor Park. Res. Med. Supt., Dr. J. R. Gilmour. Burley-in-Wharfedale station, Mid. & N.E., $\frac{1}{2}$ mile.

Bury, (Lancs.).—*Oaklands*, Walmersley. Res. Med. Supt., Dr. Philip J. Mould.

Buxton.—*Wye House*. Res. Med. Supt., W. W. Horton, M.D. Buxton, L. & N. W.R. and M.R., 10 minutes. *See also p. 98*

Caerleon (Mon.).—*Newport Borough Asylum*. Res. Med. Supt., W. F. Nellis, M.D. Caerleon, $\frac{1}{4}$ mile.

Cambridge.—*County Mental Hospital*, Fulbourn. Res. Med. Supt., Dr. M. A. Archdale. Cambridge station, 3 miles.

Canterbury.—*Stone House*, St. Martin's. Res. Med. Supt., Dr. E. F. Sall. Canterbury East.

Cardiff.—*Cardiff City Mental Hospital*, Whitechurch. Res. Med. Supt., E. Goodall, M.D. Llandaff, T.V.R., $\frac{1}{2}$ mile.

Carlisle.—*Cumberland & Westmorland Mental Hospital*. Res. Med. Supt., W. F. Farquharson. M.D. Carlisle, 3 miles.

Carlow.—*District Asylum*. Res. Med. Supt., Dr. T. A. Greene. Carlow, $\frac{1}{2}$ mile.

Carmarthen.—*Joint Counties Mental Hospital*. Res. Med. Supt., J. Richards, F.R.C.S.E. Carmarthen, 2 miles.

Castlebar (Co. Mayo).—*District Asylum*. Res. Med. Supt., F. C. Ellison, M.D. Castlebar, 1 mile.

Chartham (near Canterbury).—*Chartham and Kent County Mental Hospital*. Res. Med. Supt., M. A. Collins, M.D. Chartham, 1 mile.

Cheadle.—*Cheadle Royal Mental Hospital*. Res. Med. Supt., J. Sutcliffe, L.R.C.F., M.R.C.S. Heald Green, 1 mile.

Chester.—*Cheshire County Asylum*. Res. Med. Supt., G. Hamilton Grills, M.D. Chester station, $1\frac{1}{2}$ miles.

Chichester.—*West Sussex Mental Hospital*, Graylingwell. Res. Med. Supt., Dr. H. A. Kidd. Chichester station, $1\frac{1}{2}$ miles.

See also p. 94

Church Stretton.—*Stretton House*, Shropshire (for gentlemen). Med. Supt., Dr. A. A. Watson. Res. Med. Off., Dr. J. W. W. Adamson. Church Stretton station, $\frac{1}{4}$ mile. *See also p. 85*

The Grove House, All Stretton, Shropshire (for ladies). Res. Prop. and Med. Supt., Dr. J. McClintock.

Clonmel.—*District Asylum*. Res. Med. Supt., Dr. Bagenal C. Harvey. Clonmel, 1 mile.

Colchester.—*Essex and Colchester Mental Hospital*, Severalls. Res. Med. Supt., Dr. R. C. Turnbull. Colchester station, $1\frac{1}{2}$ miles.

Cork.—*District Asylum*. Res. Med. Supt., Dr. J. J. FitzGerald. Cork, 2 miles.

Lindville, Cork. Res. Med. Props., Dr. C. A. P. Osburne and Dr. J. C. Osburne.

Cupar (Fifeshire).—*Fife and Kinross District Asylum*. Res. Med. Supt., James H. Skeen, M.B. Springfield station, N.B.R., $\frac{1}{2}$ mile.

Darlington (Durham).—*Middleton Hall*, Middleton St. George. Res. Med. Supt., L. Harris-Liston, M.D. Dinsdale station, 1 mile.

Dartford.—*City of London Mental Hospital*, near Dartford. Res. Med. Supt., Dr. R. H. Steen. Dartford, S.E.R., 2 miles. *See also p. 87*

Denbigh (North Wales).—*North Wales Counties Asylum*. Med. Supt., Frank G. Jones, M.D. Denbigh, 1 mile.

Derby.—*Borough Mental Hospital*, Rowditch. Res. Med. Supt., Dr. S. R. Macphail. G.N.R. station, 1 mile; M.R., 2 miles.

The County Asylum, Mickleover. Res. Med. Supt., M. L. Rowan, M.D. Derby, M.R., 5 miles; Mickleover, G.N.R., 2 miles.

Devizes.—*Wills County Asylum*. Res. Med. Supt., S. J. Cole, M.D. Devizes, 1 mile.

Dorchester.—*Dorset Mental Hospital*. Res. Med. Supt., G. E. Peachell, M.D. Dorchester, 3 miles.

Downpatrick.—*Down District Asylum*. Res. Med. Supt., M. J. Nolan, L.R.C.P.I. and L. M. Downpatrick, 1 mile.

Dublin.—*Bloomfield*, Morehampton Rd. Med. Off., H. T. Bewley, M.D. Dublin, 1 mile.

Elm Lawn, Dundrum, Co. Dublin (ladies). Prop., Miss Bernard. Vis. Phys., Dr. A. S. Goff.

Farnham House and Maryville, Finglas, Dublin. Res. Med. Supt., H. P. D'Arcy Benson, M.D. Cab from Dublin, 2 miles.

Highfield (for ladies), Drumeondra; *Hampstead* (for gentlemen), Glasnevin. Res. Med. Supts., Hy. M. Eustace, B.A., M.D., and Wm. N. Eustace, L.R.C.P.I. & S.I. By rail, Dublin. See also p. 94

House of St. John of God, Stillorgan, Dublin. Res. Phys., Dr. P. O'Connell. Stillorgan station, $\frac{1}{2}$ mile.

Richmond District Asylum, Dublin. Res. Med. Supt., Dr. J. O'Connor Donelan; also *Richmond District Asylum* (*Portrane Branch*), Donabate, Dublin. Med. Supt., Dr. J. O'Connor Donelan; Dep. Med. Supt., J. M. Redington, F.R.C.S.I. Donabate station, 1 mile.

St. Patrick's Hospital, James's Street, Dublin. Res. Med. Supt., Dr. R. R. Leeper. Branch Asylum, *St. Edmondsbury*, at Lucan. See also p. 80

St. Vincent's Asylum, Fairview, Dublin. Vis. Physicians, John Murphy, F.R.C.P.I., and F. X. Callaghan, F.R.C.P.I. Apply to the Superioress.

Stewart Institution, Palmerston, Chapelizod, Co. Dublin. Res. Med. Supt., F. E. Rainsford, M.D. Kingsbridge station, $2\frac{1}{2}$ miles.

Verville, Clontarf, near Dublin. Prop., Dr. P. D. Sullivan.

Dudley (Stafford)—Ashwood House, Kingswinford. Props., Drs. Peacock and Pietersen. Res. Med. Supt., Dr. J. F. G. Pietersen. Stourbridge Junc., $3\frac{1}{2}$ miles; Dudley station, 4 miles; Wolverhampton, 7 miles. Tel.: 19 Kingswinford.

See also p. 90

Dumfries.—Crichton Royal Institution. Res. Med. Supt., Dr. C. C. Easterbrook. Dumfries, 1 mile.

Dundee.—Baldovan Institution (for the treatment and education of the feeble-minded). Med. Supt., W. B. Drummond, F.R.C.P.E. Downfield, 1 mile; Dundee, $4\frac{1}{2}$ miles.

Dundee District Asylum, Westgreen, Dundee. Res. Med. Supt., W. Tuach-Mackenzie, M.D. Dundee, 3 miles; Liff, $1\frac{1}{2}$ miles.

Dundee Royal Asylum, Gowrie House, Dundee. Med. Off., A. B. Dalgetty, M.D. Sec., J. Wilkie, 20, Reform Street, Dundee.

Durham.—County Asylum, Winterton. Res. Med. Supt., Dr. H. G. Cribb. Sedgfield station, $2\frac{1}{2}$ miles, by bus.

Gateshead County Borough Mental Hospital, Stannington, Newcastle-on-Tyne. Res. Med. Supt., Lt.-Col. J. V. G. B. Tighe, M.B.

Sunderland Borough Mental Hospital, Ryhope. Res. Med. Supt., J. Middlemass, M.D. Ryhope station, 1 mile.

Edinburgh.—Edinburgh District Asylum, Bangour Village, West Lothian. Res. Med. Supt., J. Keay, M.D. Bangour (Private) N.B.Rly.

Midlothian and Peebles District Asylum. Res. Med. Supt., James H. C. Orr, M.D. Rosslynlee, 1 mile; Edinburgh, 12 miles.

Royal Edinburgh Asylum, Morningside. Res. Phys. Supt., Professor George Robertson. Edinburgh, $1\frac{1}{2}$ miles.

New Saughton Hall, Polton. Res. Med. Supt., S. R. Macphail, M.D., Edin. Polton station, 5 minutes; Loanhead, 10 minutes' walk. See also p. 84

Elgin.—Morayshire District Asylum. Res. Supt., Miss Annie A. Kinloch. Vis. Med. Off., Dr. D. G. Campbell. Elgin, $1\frac{1}{2}$ miles.

Enfield.—Elm Lodge, Clay Hill (for ladies). Res. Licensee, Mrs. Watson. Enfield station, $1\frac{1}{2}$ miles.

Ennis.—District Asylum. Res. Med. Supt., Dr. F. O'Mara. Ennis station, 2 miles.

Enniscorthy (Co. Wexford)—District Lunatic Asylum. Res. Med. Supt., Dr. H. T. J. Kennedy. Enniscorthy, 1 mile.

Epsom (Surrey)—The Silver Birches, Church Street (for ladies). Res. Licensee, Miss Daniel. Co-Licensee, Dr. E. G. C. Daniel. L. & S.W.R. and L.B. & S.C.R., 5 minutes. Tel.: 346 P.O. Epsom.

See also p. 92

Exeter.—City Mental Hospital, Digbys, Heavitree. Res. Med. Supt., G. N. Bartlett, M.B., B.S. Exeter, 3 miles.

See also p. 96

Court Hall, Kenton, near Exeter. Res. Licensees, Miss Mules, M.D., B.S., and Miss A. S. Mules. Starcross, 1 mile.

Devon Mental Hospital, Exminster. Res. Med. Supt., Dr. Arthur N. Davis. Exminster, $1\frac{1}{2}$ miles; Exeter, 4 miles.

Wonford House Hospital for the Insane, Exeter. Res. Med. Supt., W. B. Morton, M.D. Exeter station (Queen St.) $1\frac{1}{2}$ miles; (St. David's), 2 miles.

Fairford (Gloucestershire)—Fairford Retreat. Res. Med. Supt. and Prop., Dr. A. C. King-Turner. Fairford, 1 mile.

Glasgow.—District Mental Hospital, Woodilee. Res. Med. Supt., H. Carre, L.R.C.P. & S. Lenzie station, 1 mile; Glasgow, 8 miles.

Glasgow District Hospital for Mental Diseases, Gartloch. Res. Med. Supt., W. A. Parker, M.B. Garnkirk station, 1 mile.

Govan District Asylum, Hawkhead, Glasgow. Res. Med. Supt., Dr. J. H. MacDonald. Crookston station.

Kirklands Asylum, Bothwell, Glasgow. Res. Med. Supt., Wm. M. Buchanan, M.B. Bothwell and Fallside stations, $\frac{1}{2}$ mile; Glasgow, 9 miles.

Lanark District Asylum, Hartwood, Lanarkshire. Med. Supt., Dr. N. T. Kerr. Hartwood station, $\frac{1}{2}$ mile.

Royal Asylum, Gartnavel. Res. Phys. Supt., Landel R. Oswald, M.B.

Smithston Asylum, Greenock. Res. Med. Supt., Wm. Leggett, M.D. Greenock West, $1\frac{1}{2}$ miles; Ravenscraig, $\frac{1}{2}$ mile.

Gloucester.—*Barnwood House*. Res. Med. Supt., Arthur A. D. Townsend, M.D. Gloucester, 2 miles. See also p. 91

Gloucester County Asylums, Wotton and Barnwood, Gloucester. Res. Med. Supt., Dr. J. Marnan. Gloucester station, 1 mile.

Guernsey.—*St. Peter Port Asylum*. Med. Off., E. K. Corbin, M.R.C.S.

Haddington, N.B.—*East Lothian District Asylum*. Supt., Miss Jean Sinclair. Med. Off., H. H. Roberts, M.D. Haddington station, 10 minutes.

Hatton (near Warwick).—*County Asylum*. Res. Med. Supt., A. Miller, M.B. Also *Leigh House*, for private patients. Hatton, G.W.R. station, 2 miles; Warwick, 3 miles.

Haywards Heath.—*Brighton County Borough Mental Hospital*. Res. Med. Supt., C. Planck, M.A., M.R.C.S. Haywards Heath, $1\frac{1}{2}$ miles.

Hellingly.—*East Sussex County Mental Hospital*, near Eastbourne. Res. Med. Supt., F. R. P. Taylor, M.D., B.S. Hellingly, 1 mile. See also p. 87

Henley-in-Arden (Warwickshire).—*Glen-dosail* (for both sexes). Res. Med. Prop., Dr. S. H. Agar. Henley-in-Arden, G.W.R., $\frac{1}{2}$ mile.

Hereford.—*Hereford County and City Mental Hospital*. Res. Med. Supt., J. G. Smith, M.D. Bears Court, G.W., Mid., and L. & N.W.R., Hereford, 3 miles.

Huddersfield (near).—*West Riding Asylum*, "Storches Hall," Kirkburton. Res. Med. Supt., T. S. Adair, M.D. Kirkburton, L. & N.W.R., 1 mile.

Hull.—*City Asylum*. Res. Med. Supt., J. Merson, M.D. Willerby station, 1 mile; Hull, 6 miles.

Inverness.—*District Asylum*. Res. Med. Supt., T. C. Mackenzie, M.D. Inverness, $2\frac{1}{2}$ miles.

Ipswich.—*Borough Mental Hospital*. Res. Med. Supt., Dr. W. M. Ogilvie. Ipswich, 2 miles.

Isle of Man.—*Mental Hospital*, Union Mills, Douglas. Res. Med. Supt., F. C. Blakiston, M.R.C.S., L.R.C.P. Union Mills, $\frac{1}{2}$ mile.

Isle of Wight.—*The County Asylum*, Whitecroft. Res. Med. Supt., W. J. A. Erskine, M.D. Blackwater, $\frac{1}{2}$ mile; or Newport, $2\frac{1}{2}$ miles.

Isleworth (Middlesex).—*Wyke House*. Res. Prop., Dr. F. Murchison. Isleworth, Brentford, and Osterley station, 1 mile.

Ivybridge.—*Plymouth Mental Hospital*. Res. Med. Supt., Dr. Wm. Starkey. Bittaford, $\frac{1}{2}$ mile; Wrangaton, G.W.R., $1\frac{1}{2}$ miles; Ivybridge, 3 miles.

Jersey.—*Cranbourne Hall*, Grouville. Med. Supt., A. C. Stamborg, O.B.E., M.B. Grouville, 2 minutes' walk.

Jersey Asylum. Res. Med. Supt., Julius Labey, M.R.C.S. Gorey Village, 1 mile.

Kilkenny.—*District Asylum*, Kilkenny. Res. Med. Supt., Louis Buggy, L.R.C.P. Kilkenny station, $\frac{1}{2}$ mile.

Killarney.—*District Asylum*. Res. Med. Supt., E. W. Griffin, M.D. Killarney, $\frac{1}{2}$ mile.

Knowle (near Fareham, Hants.).—*County Asylum*. Med. Supt., H. K. Abbott, M.D. Knowle platform, $\frac{1}{2}$ mile.

Lancashire (near Newton-le-Willows).—*Haydock Lodge*, Private Mental Hospital. Res. Med. Prop., Dr. C. T. Street. Newton-le-Willows, 2 miles. See also p. 81

Lancaster.—*County Asylum*. Res. Med. Supt., D. M. Cassidy, M.D. Lancaster, L. & N.W. and Midland stations, each $1\frac{1}{2}$ miles.

Larbert (Stirlingshire).—*The Royal Scottish National Institution* (for education of imbecile children). Res. Med. Supt., Dr. R. D. Clarkson. Larbert station, 1 mile.

Leek (Stafford).—*County Mental Hospital*, Cheddleton. Med. Supt., W. F. Menzies, M.D. Wall Grange station, 1 mile.

Leicester.—*City Mental Hospital*, Hum-berstone. Res. Med. Supt., J. F. Dixon, M.D. Humberstone, $\frac{1}{2}$ mile; Leicester, 2 miles.

Leicestershire and Rutland Asylum. Res. Med. Supt., R. C. Stewart, M.R.C.S. Nar-borough, $\frac{1}{2}$ mile; Leicester, 6 miles.

Letterkenny.—*Donegal District Asylum*. Res. Med. Supt., E. E. Moore, M.D. Letterkenny and Lough Swilly Rly., 1 mile.

Lichfield.—*County Mental Hospital*, Burntwood, near Lichfield. Res. Med. Supt., J. B. Spence, M.D. Lichfield City, $3\frac{1}{2}$ miles; Hammerwich, $1\frac{1}{2}$ miles.

Limerick.—*District Asylum*. Res. Med. Supt., Dr. P. J. Irwin. Limerick station, $\frac{1}{2}$ mile.

Lincoln.—*District Asylum*, Bracebridge. Res. Med. Supt., Dr. T. L. Johnston. $2\frac{1}{2}$ miles from Lincoln G.N.R. station.

The Lawn, Lincoln. Res. Med. Supt., Arthur P. Russell, M.B. Lincoln station, 1 mile. See also p. 96

Liverpool.—*Shaftesbury House*, Formby, near Liverpool and Southport. Res. Med. Supt., Stanley A. Gill, M.D., M.R.C.P. Formby, $\frac{1}{2}$ mile. See also p. 82

Tue-Brook Villa, Liverpool, E. Res. Med. Supts., Drs. Tisdall and Moyes. Tue Brook station $\frac{3}{4}$ mile, or Green Lane car. See also p. 92

London.—*Bethlem Royal Hospital*, Lambeth Road, London, S.E. Phys. Supt., J. G. Porter Phillips, M.D., M.R.C.P. See also p. 80

Brooke House, Clapton, N.E. Res. Med. Supt., Dr. Gerald Johnston. Clapton, G.E.R.

Camberwell House, 33, Peckham Road, S.E.5. Res. Med. Supt., F. H. Edwards, M.D., M.R.C.P. Asst. Med. Off., H. J. Norman, M.B., Ch.B., D.P.H. Tel.: "Psycholia, London." Telephone: New Cross 1057. See also p. 97

Chiswick House, Chiswick. Res. Lic., C. M. Tuke, M.R.C.S. Chiswick station, $\frac{1}{2}$ mile; Turnham Green station, 1 mile.

Clarence Lodge, Clapham Park, S.W. Prop., Mrs. F. Thwaites. Med. Off., Dr. Percy Smith. Clapham Road, and Clapham Common (Electric), 15 minutes. Tel. No. 494 Brixton. See also p. 89

Featherstone Hall, Southall (for ladies). Res. Med. Lic., W. H. Bailey, M.D. Southall station, 5 minutes.

Fenstanton, Christchurch Road, Streatham Hill. Res. Med. Supt., J. H. Earls, M.D. Streatham Hill, 5 minutes.

Flower House, Catford, S.E. Res. Med. Supt., Dr. C. C. Bullmore. S. E. & C. Ry., Beckenham Hill, 5 minutes.

Halliford House, Sunbury-on-Thames, S.W. Res. Med. Supt., W. J. H. Haslett, M.R.C.S. Sunbury station, $1\frac{1}{2}$ miles.

Hayes Park, Hayes, Middlesex. Res. Med. Off., Dr. R. F. Stilwell. Hayes, 2 miles.

Hendon Grove Asylum (for ladies), Hendon. Med. Lic., H. L. de Caux, L.M.S.S.A., L.S.A. (Lond.). By M.R., Hendon station, $\frac{1}{2}$ mile.

London County Colony (for Insane Epileptics), Epsom. Res. Med. Supt., —. L. & S.W. & L.B. & S.C.R., $1\frac{1}{2}$ miles.

London County Mental Hospital, Banstead Downs, near Sutton, Surrey. Res. Med. Supt., Dr. P. C. Spark. Belmont station, $\frac{1}{2}$ mile; Sutton station, $1\frac{1}{2}$ miles.

London County Mental Hospital, Bexley, Kent. Res. Med. Supt., T. E. K. Stansfield, C.B.E., M.B. Bexley station, $1\frac{1}{2}$ miles.

London County Mental Hospital, Cane Hill, Coulsdon, Surrey. Res. Med. Supt., Lt.-Col. S. C. Elgee, O.B.E., L.R.C.P. & L.R.C.S., (I.). Coulsdon, S.E.R., or Coulsdon & Smitham Downs, 10 minutes.

London County Mental Hospital, Claybury, Woodford Bridge, Essex. Med. Supt., G. Foster Barham, M.D. Woodford Bridge station, G.E.R., $1\frac{1}{2}$ miles.

See also p. 95
London County Mental Hospital, Colney Hatch, N. Res. Med. Supt., S. J. Gilfillan, O.B.E., M.A., M.B. New Southgate, G.N.R.

London County Mental Hospital, Hanwell. Med. Supt., A. W. Daniel, M.D.

London County Mental Hospital, Horton, Epsom. Res. Med. Supt., Lt.-Col. J. R. Lord, C.B.E., M.B., C.M. L. & S.W. Ry., $1\frac{1}{2}$ miles, L.B. & S.C.R., $1\frac{1}{2}$ miles.

London County Mental Hospital, Long Grove, Epsom. Res. Med. Supt., D. Ogilvy, M.D. L. & S.W.R. and L.B. & S.C.R.

London County Mental Hospital, The Manor, Epsom. Res. Med. Supt., Dr. E. S. Littelljohn. L. & S.W. and L.B. & S.C.R.

Mead House, Hayes (for ladies). Med. Licensees, Dr. H. F. Stilwell and Dr. R. J. Stilwell.

Moorcroft House, Hillingdon, Uxbridge, 2 miles. Med. Licensees, Mr. J. F. Stilwell, Dr. R. J. Stilwell and Dr. G. W. B. James. West Drayton station, 2 miles.

Newlands House, Tooting Bec Common, S.W. 17. Prop. and Res. Phys., Dr. J. Noel Sergeant. Streatham Hill station, 1 mile. Motor bus No. 49. See also p. 96

Northumberland House, Green Lanes, N. Med. Supt., Bernard Hart, M.D. Finsbury Park station, 1 mile. See also p. 87

Otto House, 47, North End Road, West Kensington (for ladies). Lic. Prop., Mrs. Sutherland. Lady Supt., Miss Brodie. West Kensington station, 1 mile; Barons Court station (Piccadilly Tube), 1 mile. See also p. 87

Peckham House, 112, Peckham Road, S.E. Props., A. H. & H. G. Stocker. Res. Med. Supt., Dr. F. R. King. Peckham Rye station, 10 minutes' walk. See also p. 95

Springfield Mental Hospital, Tooting, S.W. 17. Med. Supt., R. Worth, O.B.E., M.B., B.S. Wandsworth Common station, 1 mile.

St. Luke's Hospital for Mental Diseases, Old Street, E.C. (Offices, 19, Nottingham Place, W.) See also p. 61

The Priory, Roehampton, S.W., 15. Res. Med. Supt., James Chambers, M.D. Barnes station, 10 minutes.

West Ham Mental Hospital, Goodmayes, Ilford. Res. Med. Supt., Dr. John Custance Shaw. Goodmayes, 1 mile.

Wood End House, Hayes (ladies). Med. Lic., Dr. R. J. Stilwell and Dr. G. W. B. James. Hayes station, 1 mile; Uxbridge, 3 miles.

Londonderry.—*District Asylum*. Res. Med. Supt., John Watson, M.C., M.B., B.Ch. Londonderry, 1 mile.

Macclesfield.—*Cheshire County Asylum*, Parkside, and "Uplands" for private patients. Res. Med. Supt., H. Dove Cormac, M.B., M.S. Macclesfield, 1 mile.

See also p. 96

Maidstone.—*Kent County Mental Hospital*. Res. Med. Supt., H. Wolseley-Lewis, F.R.C.S., M.D. Maidstone, 1½ miles.

Malling Place, West Malling, Kent. Res. Med. Supt., Dr. G. H. Adam. Malling station, 1 mile.

Market Lavington (Wilts.).—*Fiddington House*. Res. Med. Supt., J. R. Benson, F.R.C.S. Lavington, G.W.R., 1 mile; Devizes, 6 miles.

Maryborough (Queen's County).—*District Asylum*. Res. Med. Supt., Dr. P. Coffey. Maryborough, ½ mile.

Melrose, N.B.—*Rowburgh, Berwick, and Selkirk District Asylum*. Res. Med. Supt., Patrick Steele, M.D. Melrose, 1 mile.

Melton.—*St. Audry's Hospital for Mental Diseases*, near Woodbridge. Res. Med. Supt., J. R. Whitwell, M.B. Melton station, 1½ miles; Woodbridge station, 2½ miles.

Menston (near Leeds).—*West Riding Asylum*. Res. Med. Supt., S. Edgerley, M.D. Guiseley, 1 mile.

Merstham (Surrey).—*Surrey County Asylum*, Netherne. Med. Supt., Dr. P. C. Coombes. Coulsdon station, 2 miles.

Middlesbro'.—*Mental Hospital*. Res. Med. Supt., Dr. J. W. Geddes. Middlesbro', 2 miles.

Monaghan (Ireland).—*District Asylum*. Res. Med. Supt., Dr. T. P. Conlon. Monaghan, ½ mile.

Montrose, N.B.—*The Royal Asylum*. Res. Med. Supt., C. J. Shaw, M.D. Hillside, ½ mile; Dubton, 1 mile.

Morpeth.—*Northumberland County Asylum*. Res. Med. Supt., Guy R. East, M.D., D.P.H. Morpeth station, 1 mile.

Mullingar.—*District Asylum*. Res. Med. Supt., Dr. Laurence Gavin. Mullingar station, 1 mile.

Newcastle-on-Tyne.—*City Mental Hospital*, Gosforth. Res. Med. Supt., H. D. MacPhail, M.D. Newcastle, 4 miles.

Northampton.—*Berrywood Mental Hospital*. Res. Med. Supt., W. Harding, M.D. Castle station, 2½ miles; Midland station, 3 miles.

St. Andrew's Hospital, Northampton. Res. Med. Supt., D. F. Rambaut, M.A., M.D. (T.C. Dub.). Northampton station, 1 mile.

See also p. 83

Norwich.—*Bethel Hospital for Mental Diseases*. Res. Med. Supt., S. J. Fielding, M.B. Cons. Phys., Saml. J. Barton, M.D. Norwich (Thorpe) station, 1 mile.

City of Norwich Mental Hospital, Hellesdon, near Norwich. Res. Phys. and Supt., Dr. David Rice. Hellesdon, 1 mile.

Heigham Hall, Norwich. Res. Med. Prop., J. G. Gordon-Munn, M.D. Thorpe station, 1½ miles.

Norfolk County Mental Hospital, Thorpe, Norwich. Res. Med. Supt., D. G. Thomson, C.B.E., M.D. Whittingham, 1 mile; Norwich, 2½ miles.

The Grove, Old Catton, near Norwich (for ladies). Res. Med. Supt., C. A. P. Osburne, F.R.C.S. Apply to the Misses McLintock.

Nottingham.—*City Asylum*, Mapperley Hill. Med. Supt., E. Powell, M.R.C.S.

Notts County Mental Hospital, Nottingham. Res. Med. Supt., S. L. Jones, M.R.C.S. Radcliffe-on-Trent, 2 miles.

The Coppice. Res. Med. Supt., David Hunter, M.B. (Camb.). Midland station, 2½ miles; Gt. Northern & Gt. Central station, 1½ miles.

See also p. 84

Omagh.—*District Asylum*. Res. Med. Supt., Dr. John Patrick. Omagh station, 2 miles.

Oxford.—*County and City Mental Hospital*, Littlemore. Res. Med. Supt., T. S. Good, O.B.E., M.R.C.S. Littlemore station. (Temporarily in use as a Ministry of Pensions Hospital.)

The Warneford, Oxford, 1½ miles. Res. Med. Supt., Alex. W. Neill, M.D. Oxford station, 2½ miles.

See also p. 89

Paisley.—*Craw Road Asylum*. Vis. Med. Off., H. C. Donald, F.R.C.S. Res. Med. Off., Miss J. Gilmore-Cox, M.B., Paisley, 1 mile.

Paisley District Asylum, Riccartbar. Med. Off., Dr. Mary R. Knight. Paisley West, ½ mile.

Renfrew District Asylum, Dykebar, Paisley. Res. Med. Supt., R. D. Hotchkis, M.D. Paisley, 2½ miles.

Perth.—*District Asylum*, Murthly. Res. Med. Supt., Lewis C. Bruce, M.C., M.D. Murthly station adjoins the Asylum.

James Murray's Royal Asylum, Perth (for patients of the middle and upper classes). Phys. Supt., W. D. Chambers, M.A., M.D. (Edin.). Perth station, under 2 miles.

See also p. 82

Plympton.—*Plympton House*, Plympton, South Devon. Res. Props., Dr. Alfred Turner and Dr. J. C. Nixon. Plympton, 1 mile; Marsh Mills, 2 miles; Plymouth, 5 miles.

See also p. 91

Portsmouth.—*Borough Mental Hospital*. Res. Med. Supt., H. Devine, O.B.E., M.D. (Lond.). Clerk and Steward, John C. Kersey. Fratton, 1½ miles.

See also p. 94

Prestwich (near Manchester).—*County Asylum.* Res. Med. Supt., Dr. F. Perceval. Prestwich, $\frac{3}{4}$ mile.

Rainhill (nr. Liverpool).—*County Asylum.* Res. Med. Supt., T. P. Cowen, M.D. St. Helens, $2\frac{1}{2}$ miles; Rainhill, 1 mile.

Rotherham (Yorkshire).—*The Grange,* 5 miles from Sheffield (for ladies). Con. Phys., W. C. Clapham, M.D. Res. Phys., G. E. Mould, M.R.C.S., L.R.C.P. Grange Lane station, G.C.R., $\frac{1}{2}$ mile.

See also p. 89

St. Albans.—*Herts County Mental Hospital,* Hill End. Med. Supt., A. N. Boycott, M.D. Hill End station, G.N.R., 3 minutes.

Napsbury Mental Hospital (under the Middlesex County Council), near St. Albans, Herts. Res. Med. Supt., L. W. Rolleston, M.B., B.S. Napsbury, M.R., 5 minutes' walk.

St. Leonards-on-Sea.—*Ashbrook Hall,* Hollington (for ladies). Res. Lics., Mr. and Mrs. Charles E. H. Somerset. Warrior Square station, 2 miles.

Salisbury.—*Fisherton House Mental Hospital.* Med. Supt., J. Kennedy Will, M.D. Salisbury station, L. & S.W. and G.W., 5 minutes.

Laverstock House, Salisbury. Res. Med. Supt., Gordon A. Jackson, M.B., B.A. Salisbury, $1\frac{1}{2}$ miles.

See also p. 93

Shrewsbury.—*Shropshire County Asylum.* Res. Med. Supt., W. S. Hughes, M.B., B.S. Shrewsbury station, $2\frac{1}{2}$ miles.

Sleaford.—*Kesteven County Asylum.* Med. Supt., J. A. Ewan, M.A., M.D. Rauceby, G.N.R., $\frac{1}{2}$ mile.

Sligo.—*District Asylum.* Res. Med. Supt., Dr. Joseph Petit. Sligo station, $1\frac{1}{2}$ miles.

Stafford.—*County Mental Hospital.* Res. Med. Supt., B. H. Shaw, M.D. Stafford, 1 mile.

Coton Hill Mental Hospital, Stafford. Res. Med. Supt., R. W. Hewson, L.R.C.S. & P. (Edin.). Stafford, 1 mile.

See also p. 95

Stirling.—*District Asylum,* Larbert. Med. Supt., Dr. R. B. Campbell. Larbert, $1\frac{1}{2}$ miles.

Stone (near Aylesbury).—*Bucks Mental Hospital.* Res. Med. Supt., H. Kerr, M.D. Aylesbury station, $3\frac{1}{2}$ miles.

See also p. 90

Talgarth.—*Brecon and Radnor Asylum.* Res. Med. Supt., R. Pugh, M.D.

Tamworth (Staffs.).—*The Moat House* (for ladies). Res. Licensees, Edward Hollins, M.A., and Mrs. S. A. Michaux. Tamworth station, $\frac{3}{4}$ mile.

Taunton.—*Somerset & Bath Asylum,* Cotford, near Taunton. Res. Med. Supt., Dr. H. T. S. Aveline. Norton Fitzwarren station, 2 miles.

Ticehurst (Sussex).—*Ticehurst House.* Res. Med. Supt., C. F. F. McDowall, M.D. Wadhurst, 4 miles, or Ticehurst Road, 3 miles.

Tonbridge.—*Redlands.* Res. Med. Supt., W. A. Harmer, L.S.A. Tonbridge junc., $2\frac{1}{2}$ miles.

Virginia Water.—*Holloway Sanatorium,* Hospital for the Insane, St. Ann's Heath. Res. Med. Supt., W. D. Moore, M.D. Asst. Med. Offs., T. E. Harper, L.R.C.P., C. Rutherford, M.B., B. W. Brown, M.B., and Elizabeth Casson, M.B. Virginia Water station, 5 minutes. Seaside Branch, St. Ann's, Canford Cliffs, Bournemouth. Med. Off., C. E. C. Williams, M.D.

See also p. 88

Wadsley (near Sheffield).—*South Yorkshire Asylum.* Res. Med. Supt., W. J. N. Vincent, C.B.E., M.D. Wadsley Bridge, 1 mile; Sheffield, 4 miles. (Temporarily in use as a War Hospital.)

Wakefield.—*West Riding Asylum.* Res. Med. Supt., Prof. J. Shaw Bolton, M.D. Kirkgate and Westgate station, 1 mile.

Wallingford (Berks.).—*Berkshire Mental Hospital.* Res. Med. Supt., Dr. Walter Woolfe Read. Cholsey, 1 mile.

Warlingham (Surrey).—*Croydon Mental Hospital.* Res. Med. Supt., E. S. Pasmore, M.D. Upper Warlingham, $3\frac{1}{2}$ miles.

Warrington (Lancs.).—*Lancashire County Asylum,* Winwick. Res. Med. Supt., A. Simpson, C.B.E., M.D. Warrington, $2\frac{1}{2}$ miles.

Waterford.—*Carriglea Private Asylum.* Conducted by the Order of Bon Sauveur. Vis. Phys., Dr. J. W. Williams.

St. Patrick's Institution, Belmont Park, Waterford. Conducted by the Brothers of Charity. Vis. Phys., Dr. W. R. Morris. Waterford station, 1 mile.

Waterford District Asylum. Res. Med. Supt., Dr. Alexis FitzGerald. G.S. & W.R., North station, 2 miles.

Wells.—*Somerset and Bath Asylum,* Wells, Som. Res. Med. Supt., Dr. J. E. P. Shera. Wells station, $1\frac{1}{2}$ miles.

Whitchurch (Salop).—*St. Mary's House.* (For ladies only.) Res. Med. Supt., C. H. Gwynn, M.D. Whitchurch, 1 mile.

Whittingham (near Preston).—*County Asylum*. Res. Med. Supt., Dr. R. M. Clark. Whittingham station, 3 mins.

Winchelsea (Sussex).—*Peritau*, near Hastings (for ladies). Physician, Harvey Baird, M.D. Winchelsea station, 1 mile.

Woking.—*Surrey County Mental Hospital*, Brookwood. Res. Med. Supt., J. A. Lowry, M.D. Brookwood station, 1½ miles.

Worcester.—*County & City Mental Hospital*, Powick. Res. Med. Supt., Dr. H. F. Fenton. Worcester station, 4 miles.

York.—*Bootham Park Registered Hospital*, York. Res. Med. Supt., G. R. Jeffrey, M.D. York station, 1 mile.

See also p. 96

The Pleasaunce (ladies only). Phys. Supt. and Res. Licensee, L. D. H. Baugh, M.B. York, 1½ miles. *See also p. 86*

The Retreat, York. Res. Med. Supt., Bedford Pierce, M.D., F.R.C.P. (Lond.). York station, 1½ miles. *See also p. 92*

North Riding of Yorkshire Asylum, Clifton. Res. Med. Supt., A. I. Eades. York, 2 miles.

York City Asylum, Fulford, York. Res. Med. Supt., Dr. C. L. Hopkins. Naburn, ½ mile.

MENTAL DEFICIENCY ACT, 1913: CERTIFIED INSTITUTIONS AND HOUSES.

Class A.—Certified Institutions. *Class B.*—Institutions approved under Section 37.

Class C.—Certified Houses. *Class D.*—Approved Homes.

BUCKINGHAMSHIRE.

Winslow Union Workhouse, Winslow.—20 male, 20 female, adults. Feeble minded and imbecile. Managers, Winslow Board of Guardians. (*Class B.*)

CHESHIRE.

Sandlebridge, near Alderley Edge.—295 males and females. Life care is provided, but only educable mentally defective children under 13 years of age are eligible for admission. Managers, Incorporated Lancashire and Cheshire Society for the Permanent Care of the Feeble Minded. Sec., E. M. Richards, 1, Brazenose Street, Manchester. (*Class A.*)

CORNWALL.

The Elizabeth-Barclay Home, Bodmin.—26 females. Matron, Miss E. Hunt; Hon. Sec., Miss E. M. S. Shaw, Roslyon, Bodmin. (*Class D.*)

CUMBERLAND.

Durran Hill House, Carlisle.—65 females. Feeble minded. Higher Grade. Sec., T. W. Hunter, Archbishop's House, Westminster, S.W. 1. Supt., Sister E. Ring. (*Class A.*)

DERBYSHIRE.

Hopwell Hall, Ockbrook.—30 males. Sec., Mrs. Kipling, The Park, Nottingham. (*Class A.*)

Whittington Hall, Whittington, near Chesterfield.—400 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control, 14, Howick Place, Victoria Street, S.W. 1. (*Class A.*)

DEVON.

Western Counties Institution, Starcross.—400 males and females (trainable children). Sec. Supt., E. W. Locke. (*Class A.*)

DORSET.

Kingsgate, West Moors, Wimborne.—9 females. Supt., Miss Mason. (*Class D.*)

DURHAM.

Monkton Hall Home for Lads, Jarrow-on-Tyne.—48 males. Sec., J. Stewart, 90, Pilgrim Street, Newcastle. (*Class A.*)

ESSEX.

Bigods Hall, R. C. Special School, near Dunmow.—61 males. Corresponding Manager, Rt. Rev. Mgr. Wm. O'Grady, St. George's, Walthamstow, E. 17. (*Class A.*)

Elloe House, Church Road, Leyton.—102 high grade feeble-minded females, over 16. Managers, The Sisters of the Sacred Hearts of Jesus and Mary, Church Road, Leyton. (*Class A.*)

Tendring Institution, Weeley, Essex.—26 males, 26 females. Managers, Guardians of the Tendring Union. H. J. Burden, Superintendent. (*Class A.*)

Royal Eastern Counties Institution, Colchester.—730 males and females, all grades. Managers, The Board of Directors. Address communications to the Medical Superintendent. (*Class A.*)

The Co-operative Sanatorium, Billericay.—56 males of the middle class. Managers, The Co-operative Sanatoria, Ltd. (*Class A.*) *See also p. 67*

Gay Bowers, West Hanningfield, Chelmsford.—7 males. Manager, Mrs. Chennells. (*Class D.*)

FLINTSHIRE.

Walmer School for the Blind and Blind Deaf, Rhyl.—13 males and females. Feeble minded. Managers, Mrs. and Miss Roberts. (Class D.)

GLOUCESTERSHIRE.

Brentry Certified Institution, Westbury-on-Trym, Bristol.—119 males, 11 females. Res. Supt., T. R. Lambert; Med. Off., Dr. Ormerod. Hon. Sec., Rev. H. N. Burden. Clifton Down, Redland, or Patchway stations, $3\frac{1}{2}$ miles. (Class A.)

Poor Law Institution, Stapleton.—16 males, 26 females. Managers, Bristol Board of Guardians. Superintendent, L. W. Williams. (Class A, B, C, and D.)

St. Mary's Home, Painswick, near Stroud.—26 females. High grade feeble minded. Supt., Mrs. H. Oddy. (Class A.)

Stoke Park Colony, Hanham Hall, Hanham, near Bristol.—240 males. Managers. The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Stoke Park Colony, Royal Victoria Home, Horfield.—42 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Stoke Park Colony, Stapleton, Bristol.—750 patients of both sexes (not exceeding 650 females or 300 males). Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.) See also p. 65

Stoke Park Colony, West Side, Stapleton.—178 males. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Royal Fort Home, Bristol.—15 females, high grade mentally deficient. Managers, Ladies' Committee. Hon. Sec., Miss Savill, 40, Tyndall's Park Road. (Class D.)

HAMPSHIRE.

St. Mary's Home, Alton.—45 mentally and morally deficient females. Managers, The Wantage Community of Sisters. (Class A.)

Poor Law Institution, Parkhurst, Isle of Wight.—4 males, 4 females. Supt., J. McKeown. Managers, Isle of Wight Board of Guardians. (Class B.)

HERTS.

Hillside Special School for Mentally Defective Boys, Buntingford.—43 males. Secretary, T. W. Hunter, Archbishop's House, Westminster, S.W. 1. (Class A.)

St. Elizabeth's Home for Epileptics, Much Hadham.—136 males and females. Applied to T. W. Hunter, Archbishop's House, Westminster, S.W. 1. (Class A.)

TK

Rowley Lodge, Rowley Green, Barnet.—12 boys and girls. Supts., The Misses Wall, Paetow, and Binney. (Class C & D.)

KENT.

Princess Christian's Farm Colony, Hildenborough.—68 males, 68 females. Managers, National Association for the Feeble Minded. Superintendent, Miss Pitman. (Class A and D.)

LANCASHIRE.

Allerton Priory R.C. Special Industrial School, Woolton, Liverpool.—106 male and female educable children. Superintendent, Sister E. Thompson. (Class A.)

Brockhall, Whalley, near Blackburn.—308 females. Feeble minded, imbeciles, and moral imbeciles. Managers, Mental Deficiency Acts Committee, Lancashire Asylums Board, Preston. (Class A.)

Pontville R.C. Special School, Ormskirk.—106 boys. Mentally defective. Managers, Sisters of the Sacred Hearts of Jesus and Mary. Correspondent, Right Rev. Monsignor Canon Finnington, 109, Great Mersey Street, Liverpool. (Class A.)

Royal Albert Institution, Lancaster.—461 males, 289 females. Managers, The Central Committee of the Royal Albert Institution, Lancaster. Secretary, Samuel Keir. (Class A.) See also p. 67

Seaford House, Waterloo Road, Seaford, near Liverpool.—210 feeble minded children. Managers, Guardians of the West Derby Union, Liverpool. (Class B.)

Linthal, Freshfield, Liverpool.—Males only. Manager, Miss Bowyer. (Class C.)

LEICESTERSHIRE.

Cross Corners, Loughborough Road, Leicester.—32 females. Feeble minded. Managers, Leicester Corporation Mental Deficiency Committee. Clerk, C. F. Smith, Alliance Chambers, Horsefair Street, Leicester. (Class A.)

LONDON.

Clifton House, 127, Uxbridge Road, Shepherd's Bush, W.—40 females. Feeble minded and moral imbeciles. Managers, The Church Army, Bryanston Street, W. (Class A.)

39, Downs Road, 41, Downs Road, 46-48, Pembury Road, Clapton, E. 5.—80 females. Managers, Committee of Girls' Training Homes, Clapton. (Class A.)

Springfield Lodge, Grove Hill Road, Denmark Hill, S.E. 5.—28 females. Managers, Salvation Army. (Class A.)

The Helping Hand Home, 16, Cutchart Hill, N.—30 females. High grade mentally deficient. Managers, Committee; Hon. Sec., Mrs. Geoffrey Russell, 17, Church Road, Hampstead, N.W. 3. (Class A.)

Kensington Guardians' Institution.—69 females. Managers, Guardians of the Poor of the Parish of St. Mary Abbots, Kensington. Supt., Mr. Francis Birch. (Class B.)

Woolwich Workhouse, Plumstead, S.E.—25 males, 45 females. Temporary. Sent by L.C.C. only. Managers, Board of Guardians of the Woolwich Union. E. G. Manning, Supt. (Class B.)

MIDDLESEX.

All Souls' Special School, Pield Heath House, Hillingdon.—89 females. Educable and imbeciles. Manager, T. W. Hunter, Archbishop's House, Westminster, S.W. 1. (Class A.)

Bramley House, Clay Hill, Enfield.—45 females. Managers, Committee for the Care of the Mentally Defective, Middlesex County Council. (Class A.)

Crathorne, Oak Lane, East Finchley, N.—32, consisting of women with their infants. Managers, Northern Heights Branch of the National Association for the Feeble Minded; Hon. Sec., Mrs. Moss-Blundell, 7, North Grove, Highgate, N. 6. (Class A.)

Enfield House, 19, Chase Side Crescent, Enfield, Middlesex.—40 males. Managers, Guardians of Edmonton Union. Superintendent, E. B. Willett. (Class A.)

Warkworth House, Isleworth.—38 boys. Managers, Middlesex County Council. Supt., S. F. Rowbotham. (Class B.)

Arniston, The Grove, Isleworth.—10 males under 14, 10 females. Managers, Misses J. M. and M. D. Isbister. (Class C.)

Normansfield, Hampton Wick.—120 males and females. Manager, Dr. R. L. Langdon-Down. (Class C.) See also p. 67

The Gables, Upper Teddington Road, Hampton Wick.—18 male and female children. Manager, Miss Frances M. Deck. (Class C.)

Alexander House, 117, High Street, Uxbridge.—24 females over 16. Managers, Committee. Supt., Miss E. Collyer. (Class D.)

Conifers, Hampton Wick.—16 females, and 3 male children. Manager, Dr. R. L. Langdon-Down. (Class D.)

Trematon, Hampton Wick.—18 males. Manager, Dr. R. L. Langdon-Down. (Class D.)

NORFOLK.

The Lodge, Bowthorpe Road, Norwich.—6 males, 20 females. Managers, The Guardians of the Poor of the Norwich Incorporation. (Class B.)

The Olleys, Seething, Norwich.—30 females, children and girls. Superintendent and Proprietress, Miss S. A. Huntly. (Class D.)

NORTHUMBERLAND.

Prudhoe Hall Colony, Prudhoe.—185, all classes. Managers, Northern Counties Joint Poor Law Committee. Clerk, J. W. Coulson, Poor Law Offices, South Shields. (Class B.)

Home of Industry, Bow Filla, Morpeth.—16 females. Feeble minded. Superintendent, Miss A. Pawsey. (Class D.)

OXFORDSHIRE.

Cumnor Rise, Oxford.—43 females. High-grade feeble-minded. Managers, Committee. Hon. Secretary, Honble P. Bruce, Radcliffe House, St. Giles, Oxford. (Class A.)

SOMERSET.

Stoke Park Colony, Leigh Court, Abbot's Leigh, nr. Bristol.—260 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Rock Hall House, Combe Down, Bath.—18 males, 19 females. Supt., Miss J. Quinton. (Class A.)

Long Ashton Poor Law Institution, Flax Bourton, near Bristol.—32 males, 34 females. Managers, Guardians of the Long Ashton Union. (Class B.)

STAFFORDSHIRE.

Burton-on-Trent Poor Law Institution.—3 males, 2 females. Managers, Guardians Burton Union. Master, R. Bareham. (Class A.)

New Cross Institution, Mental Wards, Wolverhampton.—2 males, 2 females. Cases accepted only from Wolverhampton County Borough Council. Supt., T. D. Rollinson. (Class A.)

Poor Law Institution, Dudley, Stafford.—50 males, 50 females. Managers, Guardians of the Dudley Union. (Class A.)

SUFFOLK.

Handford Home, Ranelagh Road, Ipswich.—20 females. Supt., Mrs. A. Turner. (Class A.)

St. Joseph's Home, Sudbury.—14 females. Superintendent, Miss Murray. (Class A.)

SURREY.

Croydon Union House, Queen's Road, Croydon.—20 males, 3 females. Managers, Croydon Board of Guardians. (Class A.)

Royal Earlswood Institution, Redhill.—550. Secretary, 14, Ludgate Hill. E.C. 4. (Class A.)

SUSSEX.

Arvonhurst, Burgess Hill.—20 private cases only, males and females under 16. Manager, Miss S. M. Macdowall. (Class C.)

WARWICK.

Agatha Stacey Homes, Rednal, near Birmingham.—40 females; and *Ennis-kerry, Knowle, Warwickshire.*—24 females. Managers, The Central Committee, 158, Broad Street, Birmingham. (Class A.)

Midland Counties Institution, Knowle, near Birmingham.—91 males, 40 females. Managers, The Committee. Superintendent, A. H. Williams. Medical Officer, J. O. Hollick, M.B. (Class A.)

Monyhull Colony, King's Heath, Birmingham.—Certified for 80 males, 80 females. Total accommodation 946, including uncertified cases. Managers, Guardians of the Poor of the Birmingham Union. Clerk and Solicitor, Sir James Curtis, Union Offices, Edmund Street, Birmingham. (Class B.)

WILTS.

Devizes Poor Law Institution.—16 females between the ages of 20 and 50 years. Managers, Devizes Board of Guardians. (Class B.)

Pewsey Union Workhouse, Pewsey.—12 females. Managers, Pewsey Board of Guardians. Supt., H. England (Class B.)

Poor Law Institution, Semington, near Trowbridge.—6 males, 30 females. Managers, Guardians Trowbridge and Melksham Union. Supt., C. H. Taylor. (Class B.)

WORCESTERSHIRE.

Besford Court Home, near Defford.—119 males. Supt., Rev. T. A. Newsome. (Class A.)

Evesham Union Workhouse.—Certified only for dealing with cases arising in the Evesham Union Area. Superintendent, J. H. Damen (Class B.)

YORKSHIRE.

Mid-Yorkshire Institution, Whisley, York.—90 males, 50 females. Managers, The Mid-Yorkshire Joint Board. Supt., Capt. J. Brown, I.S.O. (Class A.)

The Grange, Altofts, Normanton.—15 females, good class. Mentally deficient, epileptics. Manager, Mrs. E. A. Howard. (Class C.)

INSTITUTIONS AND HOMES FOR INEBRIATES.

LICENSED UNDER THE ACTS, 1879-1900.

The patient must sign a Form expressing a wish to enter the Home, before a magistrate. This can be done at the private residence of the patient, or at the retreat, if previous notice has been given. Two friends must also sign a declaration that they consider the patient an 'Inebriate' within the meaning of the Acts.

* NOTE:—Ashford is a Roman Catholic Religious Institution.

† Terrington St. Clement, and Torquay are C.E.T.S. Institutions.

MALES ONLY.

Folkestone.—*Capel Lodge*, near Folkestone. Res. Prop., E. Norton, M.D. Folkestone Junction, 2 miles.

Rickmansworth (Herts).—*Dalrymple House.* Apply to Res. Med. Supt., Dr. F. S. D. Hogg. Rickmansworth station, Gt. Central & Metropolitan Rlwy, $\frac{1}{2}$ mile; L. & N.W.R., 1 mile. See also p. 71

FEMALES ONLY.

*Ashford (Middlesex).**—*Ecclesfield.* Med. Supt., Dr. M. F. Cock. Apply, Mother Superior. Ashford station, 1 mile. See also p. 71

Belfast.—*The Lodge Retreat*, Irwin Avenue, Strandtown. Med. Attendant, R. W. Leslie, M.D. Bloomfield station, 5 mins. walk.

Beverley (E. Yorks).—*Albion House.* Med. Supt., Dr. George Savege. Hon. Sec., Mrs. T. R. Pentith, The Limes, Sutton-on-Hull.

Leicester.—*Melbourne House.* Principal, Mr. H. M. Riley. Med. Attendant, R. Sevestre, M.A., M.D. Camb. Station, 2 miles.

Newmains (N.B.).—*Newmains Retreat* for ladies. Hartwood station, Cal. Railway, 2 miles.

Spelthorne St. Mary (Bedfont, Middlesex).—Apply to the Sister Superior C.S.M.V. Med. Supt., Dr. H. W. Newton. Feltham, S.W.R., 1 mile.

Terrington St. Clement† (Norfolk).—*Hamond Lodge.* Res. Supt., Miss Yolland. Med. Supt., S. R. Lister, M.R.C.S. Terrington station, $\frac{1}{2}$ miles. See also p. 71

Torquay.†—*Temple Lodge.* Res. Supt., Sister in Charge. Med. Off., W. Odell, F.R.C.S. See also p. 71

UNLICENSED HOMES.

Beckenham (Kent).—*Norwood Sanatorium*, The Mansion, Beckenham Park. Med. Supt., F. Hare, M.D. Beckenham Junc. station, 10 mins. *See also p. 70*

Island of Tiree (West Highlands).—Farmhouse Boarding facilities. Apply

James B. Thomson, 2, Eden Terrace, Morningside, Edinburgh. *See also p. 71*

Lasswade, Midlothian.—*Craufurd Bank*, Temperance Home for Women. Hon. Sec., Miss Cook, 27, Regent Terrace, Edinburgh.

SANATORIA FOR CONSUMPTION AND OTHER FORMS OF TUBERCULOSIS.

Aberchalder (N.B.).—*Inverness-shire Sanatorium*. Med. Supt., D. S. Johnston, M.D. Aberchalder, 2 miles.

Aysgarth, S.O. (Yorks).—*Wensleydale Sanatorium*. Physicians, D. Dunbar, M.B., B.S., and W. N. Pickles, M.D., B.S. Aysgarth, $\frac{1}{2}$ mile, via Northallerton, N.E.R. and Hawes Junction, M.R. *See also p. 68*

Banchory (Scotland).—*Nordrach-on-Dee*. Med. Supt., G. Lucas, M.D. Banchory, $\frac{1}{2}$ miles.

Barrasford (Northumberland).—*The Newcastle-on-Tyne and Northumberland Sanatorium*. Res. Med. Supt., Dr. R. M. Penn, Barrasford, N.E.R., 4 miles.

Benenden (Kent).—*Sanatorium of "National Association for the Establishment and Maintenance of Sanatoria for Workers suffering from Tuberculosis."* Res. Med. Supt., Niven Robertson, M.D. Biddenden, 3 miles.

Bingley (Yorks.).—*Eldwick Sanatorium* (school for phthisical children). Med. Off., Dr. Margaret S. Sharp. Bingley station, 2 miles.

Birmingham (near).—*Romsley Hill Sanatorium*, Halesowen. Res. Med. Off., Dr. P. Allan. Hunnington, Mid. & G.W.R., 2 miles.

Bolton (Lancs.).—*Wilkinson Sanatorium for Consumptives*, Sharples. Med. Off., Dr. J. D. Marshall.

Bournemouth.—*Royal National Sanatorium for Consumption and Diseases of Chest*. Sec., A. G. A. Major. Res. Med. Off., W. Bertram Lawrence. Bournemouth Central, $\frac{1}{2}$ miles; Bournemouth West, $\frac{1}{2}$ mile.

The Firs Home (for advanced cases) Hon. Secs., Col. R. F. Anderson and Dr. Willes, Bournemouth. Hon. Med. Offs., C. P. Woodstock, M.D., and S. G. Champion, M.D. Lady Supt., Miss Ingram. Bournemouth Central, $\frac{1}{2}$ mile.

The Home Sanatorium, West Southbourne, near Bournemouth. Res. Med. Supt., J. E. Esslemont, M.B., Ch.B. Bournemouth Central, $2\frac{1}{2}$ miles; Boscombe, $1\frac{1}{2}$ miles; Christchurch, $2\frac{1}{2}$ miles. *See also p. 69*

Bridge of Weir (Renfrewshire).—*Consumption Sanatoria of Scotland*. Hon. Treas., Sir Joseph P. Maclay, Bart., 21, Bothwell Street, Glasgow. Res. Med. Supt., James Crockett, M.D. Bridge of Weir, 2 miles.

Brighton.—*Municipal Sanatorium* for Brighton townfolk only (pulmonary and joints). Med. Supt., Dr. Duncan Forbes, M.O.H. for Brighton. Particulars, Town Hall, Brighton.

Chagford (Devon).—*Dartmoor Sanatorium*. Res. Med. Supt., Dr. C. H. Berry. Moretonhampstead, G.W.R., 6 miles.

Chelmsford (Essex).—*Great Baddow Sanatorium*. Med. Supt., R. G. Lyster, O.B.E., M.B., B.S. Chelmsford, G.E.R., 4 miles.

Cheltenham.—*Cranham Lodge Sanatorium*, Stroud, Glos. Res. Med. Supts., A. H. Hoffman, M.D., and Geoffrey A. Hoffman, M.B. Cheltenham, 8 miles.

Salterley Grange Sanatorium, near Cheltenham. Res. Med. Supt., Dr. E. G. Glover. Leckhampton, $2\frac{1}{2}$ miles; Cheltenham, $3\frac{1}{2}$ miles.

Chesterfield (Derbyshire).—*Ashover Sanatorium*. Res. Med. Supt., Dr. James Wall. Stretton, M.R., $3\frac{1}{2}$ miles; Matlock, 4 miles.

Darlington.—*Felix House*, Middleton St. George, Co. Durham. Res. Med. Supt., C. S. Steavenson, M.B. Dinsdale, N.E.R., 3 minutes.

Devon and Cornwall Sanatorium, Didworthy, South Brent. For consumptives of the two counties. Sec., S. Carlile Davis, Esq., 5, Princess Square, Plymouth. Res. Med. Supt., Dr. W. B. Livermore, Brent, G.W.R., 2 miles.

Doneraile (Co. Cork).—*Cork County and City Sanatorium*, Heatherside. Res. Med. Supt., Dr. R. Ahern. Buttevant, G.S. & W.R., 6 miles.

Dublin.—*Peamount Sanatorium*, Hazelhatch, Dublin. Med. Supt., A. H. Hanley, C.M.G., F.R.C.S.I. Lucan or Hazelhatch, Gt. Southern Railway.

Dundee (near).—*Sidlaw Sanatorium*. Med. Supt., H. E. Fraser, M.D., Royal Infirmary, Dundee. Auchterhouse station, 1½ miles.

Durham.—*Durham County Consumption Sanatoria*. Sec., Mr. F. Forrest, 54, John Street, Sunderland. For men: Stanhope, Med. Supt., Lieut.-Col. John Gray, R.A.M.C. Stanhope station, 1 mile. For women and children: Wolsingham. Med. Supt., Dr. Menzies. Wolsingham station, ¾ mile.

Edinburgh.—*Royal Victoria Hospital for Consumption*. Under the Corporation of the City of Edinburgh, and the supervision of the Public Health Department, City Chambers, Edinburgh.

Fortbreda, Belfast.—*Forster Green Hospital for Consumption and Chest Diseases*. Sec., J. Osborne, 2, Wellingtone Place, Belfast. Belfast, 2 miles.

Frimley (Surrey).—*Brompton Hospital Sanatorium*. Res. Med. Supt., Dr. R. C. Wingfield. Frimley station, 2 miles.

See also p. 56

Grange-over-Sands.—*Westmoreland Sanatorium*, Meathop. Res. Med. Supt., C. F. Walker, M.D. Grange-over-Sands station, 2 miles.

Hastings.—*Fairlight Sanatorium*, in connection with Margaret Street Hospital for Consumption (for Out-Patients), 26, Margaret St., W. Sec., Mrs. M. C. Hawthorne. Med. Off., Dr. N. F. Stallard. Hastings, tram, about 15 minutes.

Heswall (Cheshire).—*West Derby, Liverpool, and Toxteth Park Joint Sanatorium for Children*. Med. Supt., J. B. Yeoman, M.D. Matron, Miss Bateson. Heswall, 1½ miles.

Hull.—*Hull and East Riding Convalescent Home*, Withernsea. Sec., Benjamin Brooks, Royal Infirmary, Hull. Med. Off., A. E. Sproule, L.R.C.P. Withernsea station.

Isle of Wight.—*Royal National Hospital for Consumption*, Ventnor. Senr. Res. Med. Off., Dr. R. K. Fasson. Sec., Charles W. Cox, 18, Buckingham Street, Strand, W.C. Ventnor, 1 mile.

St. Catherine's Home, Ventnor (for early cases of phthisis in children). Apply Sister-in-Charge. Med. Off., H. F. Bassano, M.A., M.B. Ventnor, 5 minutes' drive.

Kingussie (Inverness-shire).—*Grampian Sanatorium*. Res. Med. Supt., Dr. Felix Savy. Kingussie, 1 mile.

See also p. 69

Kirkcaldy.—*Sanatorium for Consumption*. Med. Supt., Dr. G. W. McIntosh. Sec., The Town Clerk. Kirkcaldy, 1 mile.

Lanark.—*City of Glasgow Sanatorium*, Bellefield, Lanark. Phys. Supt., Dr. J. W. Allan. Lanark, 20 minutes.

Lanchester (Durham).—*Maiden Law Sanatorium*. Med. Off., Dr. W. M. Morrison. Sec., W. H. Ritson. Annfield Plain station, 1 mile.

Leeds.—*Leeds Sanatorium for Consumptives*, Gateforth, near Selby, and *Leeds Hospital for Consumptives*, Armley. For poor of Leeds. Sec., C. H. Sedgwick, 37, Great George Street, Leeds.

Leysin-Feydey (Switzerland).—*Station Climatérique de Leysin*: Sanatorium Grand Hotel (Dr. Jaquerod), Sanatorium Mont-Blanc (Dr. Piguet), Sanatorium Chamossaire (Dr. Sillig), Sanatorium Belvédère. Leysin-Feydey station, from 1 to 5 minutes.

See also p. 68

Liverpool.—*Liverpool Sanatorium for Consumptives*, Kingswood, Frodsham; and *Delamere Training Colony*, for tuberculous ex-service men, Frodsham. Sec., Liverpool Hospital for Consumption, Mount Pleasant, Liverpool. Res. Phys., Alfred Adams, M.D. Frodsham, L. & N.W.R., 3½ miles.

Park Hill Sanatorium, Liverpool. Med. Supt., H. R. Macintyre, D.S.O., M.C., M.D.

Llanybyther (Carmarthenshire).—*West Wales Sanatorium*. The Welsh National Memorial to King Edward VII. Act. Res. Med. Supt., Dr. D. C. Lloyd. Llanybyther station, 3 miles.

London.—*City of London Hospital for Diseases of Chest*, Victoria Park, E. 2. Apply, Secretary. Cambridge Heath, G.E.R., Bus or Tram, 5 minutes.

Mount Vernon Hospital for Tuberculosis and Diseases of the Chest and Heart, Northwood, Northwood (Met. & G.C. Rly.), 1 mile. Res. Phys., Dr. W. G. Kinton. Out-patient department, 7, Fitzroy Square, W. Secretary, W. J. Morton.

Royal Chest Hospital, 231, City Road, E.C. Apply to the Secretary.

Manchester.—*Hospital for Consumption and Diseases of Throat and Chest*, Bowdon; *Crossley Sanatorium*, Delamere, Cheshire. (For poor and working classes, after personal examination at Manchester.) Sec., C. W. Hunt, Manchester.

Margate (Kent).—*Royal Sea-bathing Hospital* (for Surgical Tuberculosis). Sec., A. Nash, 13, Charing Cross, S.W.2. Margate West, $\frac{1}{2}$ mile.

Matlock (Derbyshire).—*Matlock Sanatorium*. Med. Supt., Dr. F. Kincaid.

Mendip Hills.—*Mendip Hills Sanatorium*, Wells, Somerset. Res. Phys., D. J. Chowry Muthu, M.D. Wells station, 3 miles. See also p. 60

Nordrach-upon-Mendip, Blagdon, nr. Bristol. Med. Supts., R. Thurnam, M.D., and Dr. D. Kennedy (Resident). Burrington station, 5 miles.

Midhurst (Sussex).—*King Edward VII Sanatorium*. Res. Med. Supt., Dr. H. O. Blanford. Midhurst, $\frac{1}{2}$ miles.

Murtle (Aberdeenshire).—*Tor-na-Dee Sanatorium*. Res. Med. Supt., Dr. Ian Struthers Stewart. Murtle, $\frac{1}{2}$ mile.

Nayland (Suffolk).—*East Anglian Sanatorium*, with *Maltings Farm Sanatorium* for poorer men and women patients, and *East Anglian Children's Sanatorium and Training Centre*, Nayland. Med. Supt., Dr. Jane Walker, 122, Harley Street, W. Bures station, G.E.R., $\frac{3}{4}$ miles.

New Cumnock (Ayrshire).—*Ayrshire Sanatorium*, Glenafton. Res. Med. Supt., E. E. Prest, M.D. New Cumnock, 3 miles.

Norfolk.—*Kelling Sanatorium*, Holt. Res. Med. Supt., Dr. J. I. W. Morris. Holt, $\frac{1}{4}$ miles.

Mundesley Sanatorium, Mundesley. Res. Phys., S. Vere Pearson, M.D. Mundesley, 1 mile.

Pines Sanatorium, Kelling Heath, near Holt. Apply Secretary. See also p. 56

Northampton.—*Northamptonshire Sanatorium*, Creaton. Res. Med. Supt., Dr. J. E. Wood. Brixworth, L. & N.W.R., 3 miles.

Nottingham.—*Ransom Sanatorium*, Sherwood Forest, Mansfield. Res. Med. Off., Dr. R. R. S. Weatherston. Mansfield, 3 miles.

Oban, Scotland.—*Argyll County Sanatorium*. Vis. Med. Off., Duncan MacDonald, M.D. Oban, 1 mile.

Peebles.—*Manor Valley Sanatorium*. Med. Off., C. B. Gunn, M.D. Peebles, 4 miles, Lyne, 2 miles.

Penmaenmawr (N. Wales).—*Pendyffryn Hall Sanatorium*. Res. Phys., Dr. G. M. Ileraty.

Peppard Common (Oxon).—*Berks. and Bucks. Joint Sanatorium*. Res. Chief Med. Off., Dr. Esther Carling. Reading, $6\frac{1}{2}$ miles.

Ringwood (Hants).—*Linford Sanatorium*. Res. Phys., H. G. Felkin, M.D., A. de W. Snowden, M.D., and H. A. F. Wilson, M.R.C.S. Ringwood sta., $2\frac{1}{2}$ mls.

Rudgwick (Sussex).—*Rudgwick Sanatorium*. Vis. London Phys., Dr. Annie McCall, 165, Clapham Road, S.W. Rudgwick station, 5 minutes.

Ruthin (N. Wales).—*Vale of Clwyd Sanatorium, Llanbedr Hall*. Res. Med. Supt., H. Morriston Davies, M.D. Ruthin station, 2 miles. See also p. 68

St. Leonards.—*Eversfield Chest Hospital*, West Hill. Res. Phys., T. Gambier, M.D. West St. Leonards, S.E.R., West Marina, L.B. & S.C.R., within 5 minutes' walk.

Sandon, near Chelmsford (Essex).—*Merivale Sanatorium*. Med. Supt., H. N. Marrett, M.R.C.S. Chelmsford station, G.E.R., $\frac{3}{4}$ miles. See also p. xli

Sheffield.—*City Hospitals and School for Consumptives*, Crimicar Lane (for males); Commonsides (for females). Med. Supt., H. J. E. H. Williams, M.D.

Shirlett, near Broseley (Shropshire).—*King Edward VII Memorial Sanatorium*. Res. Med. Supt., Dr. F. T. Turner. Much Wenlock station, 3 miles.

Skipton (Yorks).—*Eastby Sanatorium*. Res. Med. Supt., Dr. Catherine Arnott. Embsay station, 2 miles.

Stannington (Northumberland).—*"Philipson" Children's Sanatorium*. Matron, Miss J. M. Campbell. Two Vis. Physicians. Stannington station, 3 miles.

Threlkeld (Cumberland).—*Blencathra Sanatorium*. Res. Med. Supt., Dr. W. Goodchild. Threlkeld, C.K. & P.R., 2 m.

Torquay.—*Western Hospital for Incipient Consumption*, Torquay. (Temporarily closed.) Sec., W. F. Manley.

Warrenpoint (Co. Down).—*Rostrevor Sanatorium*. Phys., Dr. J. A. O'Tierney. Apply Secretary. See also p. xli.

Wicklow.—*The Royal National Hospital for Consumption for Ireland*, Newcastle, Wicklow. Res. Med. Off., C. Denys Hanan, M.D. D. & S.E.R. to Newcastle, Co. Wicklow, 3 miles.

Winsley, near Bath.—*Winsley Sanatorium*. Senr. Res. Med. Off., Dr. Chas. H. Pedley. Sec., Frederic Jones. Limpley Stoke station, 1 mile.

Worcester (near).—*Knightwick Sanatorium*. Res. Med. Supt., Dr. H. Gordon-Smith. Knightwick, G.W.R., $1\frac{1}{2}$ miles.

HYDROPATHIC ESTABLISHMENTS.

Baslow (Derbyshire).—*Grand Hotel and Hydro.* Man., A. C. Mercer. Bakewell (M.R.), $\frac{1}{4}$ miles; Grindleford (M.R.) $\frac{1}{2}$ miles.

Ben Rhydding (Yorkshire).—*Ben Rhydding Hydro.* Phys., Dr. W. R. Bates. Station, a few hundred yards.

Birmingham.—*The City Hydropathic and Massage Establishment*, 275, Broad Street. Proprietor, Robert Schenkel (*Swiss*).
See also p. 72

Bournemouth (Hampshire).—*Bournemouth Hydropathic.* Res. Med. Supt., W. J. Smyth, M.D. East station, $1\frac{1}{2}$ miles; West station, $\frac{1}{4}$ mile.

Durley Dean Hydro, Bournemouth. Manager, W. J. Evans.

Linden Hall Hydro, Bournemouth. Apply Manager.

Bristol.—*The Bristol Hydropathic*, College Green. Res. Phys., W. J. Spoor, M.B., M.R.C.S. Temple Meads, $1\frac{1}{4}$ miles.

Bute.—*Kyles of Bute Hydropathic*, Port Bannatyne, Rothessay. Man., A. Menzies. Clyde steamers call daily.

Buxton.—*Buxton Hydro Hotel.* Manager, G. W. Bosworth. Station, $\frac{1}{4}$ mins.

Haddon Hall Hydro, Buxton. Proprietress, Mrs. G. E. Hall.

Caterham (Surrey).—*Caterham Sanitarium and Hydropathic.* Med. Supt., Dr. F. C. Shone. Caterham station, 5 minutes.
See also p. 78

Clifton (near Bristol).—*Clifton Grand Spa Hotel and Hydro.* Clifton Down station, 1 mile; Bristol station, $1\frac{1}{2}$ miles.

Cork.—*St. Ann's Hill Hydropathic.* Res. Med. Supt., Dr. R. H. Barrier, O.B.E. Blarney station, $2\frac{1}{2}$ miles; Cork, 8 miles.

Crieff.—*Strathearn Hydro.* (17 miles from Perth). Res. Med. Supt., T. Gordon Meikle, M.B., C.M. Crieff station, 1 mile.

Eastbourne.—*Eastbourne Hydropathic.* Eastbourne station, 5 minutes' drive.

Edinburgh.—*Hydropathic*, Slateford.

Forres.—*Cluny Hill Hydropathic.* Vis. Phys., Dr. John Adam. Forres station, 1 mile; Inverness, 24 miles.

Grange-over-Sands.—*Haslewood Hydro.* Carnforth, L. & N.W.R., then by Furness Railway; Grange-over-Sands, $\frac{1}{4}$ mile.

Harrogate (Yorkshire).—*Harlow Manor Hydro.* Man., Miss Oakley.

The Harrogate Hydropathic Lim. Phys., Dr. Hinsley Walker. Man., W. Taylor. Harrogate station, $\frac{1}{2}$ mile.

Hexham (Northumberland).—*Tynedale Hydropathic.* Prop., F. G. Grant. Med. Supt., Dr. D. Stewart. Hexham, 1 mile; Newcastle, 19 miles.

Ilfracombe.—*The Cliffe Hydro.* Med. Supt., C. W. E. Toller, M.D.

Ilkley (Yorkshire).—*Craiglands Hydro.* Res. Phys., Maurice R. Dobson, O.B.E., M.B., B.S. (Lond.), L.R.C.P., M.R.C.S. (Eng.).
See also p. 76

The Spa Hydro Hotel, Ilkley. Man., J. S. Brodie. Vis. Phys., Dr. Henry Veale. Ilkley, 3 minutes.

Limley Stoke (near Bath).—*West of England Hydropathic.* Apply, the Secretary. Limley Stoke station.

Malvern.—*Wyche-side Hydropathic*, Malvern. Malvern Wells station, G.W.R., $\frac{1}{2}$ mile; Great Malvern station, 2 miles.

Matlock.—*Rockside Hydropathic*, Matlock. Res. Med. Supt., Dr. Marie Goodwin-Orme. Man. Directors, Miss Goodwin and Mr. John G. Goodwin. Matlock, $\frac{1}{2}$ mile.

Smedley's Hydropathic, Matlock. Res. and Vis. Physicians. Matlock station, $\frac{1}{2}$ mile; omnibus.
See also p. 75

Moffat.—*The Moffat Hydropathic.* Man. Miss Gardner. Med. Supt., Dr. D. Huskie. Moffat station, 1 mile.

Peebles.—*Peebles Hotel Hydropathic*, Res. Phys., Collis Hallowes, M.D., B.Ch. N.B. and Cal. stations about 10 to 15 minutes' walk.
See also p. 73

Southport (Birkdale Park).—*Smedley Hydropathic.* Phys., J. G. G. Corkhill, M.D. Southport or Birkdale stations.
See also p. 72

Kenworthy's Hydropathic, Southport. Phys., Dr. Kenworthy. Chapel Street (L. & Y.); Lord Street (Cheshire Line). Telephone, 80. Tel.: "Kenworthy's, Southport."
See also p. 78

Tunbridge Wells.—*The Spa Hotel.* Station about 1 mile. Apply, Manageress.

Ulverston.—*Conishead Priory Hydropathic.* Visiting Physician, Dr. Robert Ashburner. Ulverston station, $1\frac{1}{2}$ miles.

NURSING INSTITUTIONS AND PRIVATE HOMES FOR INVALIDS.

NURSING INSTITUTIONS AND TRAINING INSTITUTIONS FOR NURSES.

Liverpool.—*Male and Female Nurses' Institution*, Hope House, Hope Street.

See also p. 86

London.—*Chartered Society of Massage and Medical Gymnastics*, 157, Great Portland Street, W. Sec., Miss Templeton.

See also p. 61

Male Nurses' Association, 29, York Street, Baker Street, W. 1. Sec., W. J. Hicks.

See also p. 63

New Mental Nurses' Co-operation, 139, Edgware Road, Marble Arch, W.

See also p. 64

Norfolk Square Nursing Association, and Hyde Park Association, 49, Norfolk Square, W.2. Lady Supt., Miss Jean Hastie. Paddington, 7 minutes.

See also p. 62

St. Luke's Hospital, Old Street, E.C. Trained Nurses for Mental and Nervous Cases. Apply, Lady Supt., 19, Nottingham Place, W. 1.; also at 57, Clarendon Road, Leeds.

See also p. 61

Swedish Institute and Clinique, 106 and 108, Cromwell Road, S.W.7. For Medical Gymnastics, Massage and Electricity.

See also p. 60

The Nurses' Association, 29, York Street, Baker Street, W. 1. Sec., W. J. Hicks; Supt., Mrs. Millicent Hicks.

See also p. 63

York.—*The Retreat* (Trained Nurses' Department, for mental and nervous cases only).

See also p. 92

PRIVATE HOMES FOR INVALIDS, MATERNITY HOMES, INSTITUTIONS FOR SPECIAL CARE AND TREATMENT.

Alderley Edge (Cheshire).—*The David Lewis Colony* (for Sane Epileptics), and *Colthurst House School* (for epileptic boys). Res. Director, Alan McDougall, M.D. Alderley Edge, 3 miles.

See also p. 67

Alresford (Hants).—*Beauworth Manor*. Invalids, any cases except insanity. Speciality: Neurosis. Apply, Res. Superintendent. Alresford, 5 miles; Winchester, 8 miles.

See also p. 60

Bath.—*Lansdown Grove Hospital and Nursing Home*, Bath (invalids only; special arrangements for patients suffering from gout, rheumatism, and physical infirmities). Physicians, Dr. Percy Wilde and Dr. Wells-Beville. M. or G.W. stations, 1 mile.

See also p. 62

Cheltenham.—*Collingwood*. A nursery home for children up to seven years. Principals, Miss Dutton and Miss Adamson.

See also p. 66

Colinsburgh, Fife.—*Kenlaw House*. Functional nervous diseases. Res. Phys., Dr. W. H. Bryce.

See also p. 79

Harrogate.—*The Acomb Nursing Home*, Springfield Avenue. Maternity cases (twilight sleep). Res. Phys., W. O. Greenwood, M.D., B.S.

See also p. xli

Kenley (Surrey).—*Kenley House Nursing Home*, for ladies and gentlemen needing rest and care. Surgical, medical, rest cure. Miss Haslock.

See also p. lxii

London.—*Dowsing Medical and Therapeutic Institution*, 91 & 93, Baker Street, W.1; *The Dowsing Nursing Home*, 3, 4 & 5, Dorset Square, N.W.1.

See also p. 74

Empire Nursing Home, Vincent Square, Westminster, S.W. Apply Lady Supt.

See also p. 65

The Radium Institute, 16, Riding House Street, W. Med. Supt., A. E. Hayward Pinch, F.R.C.S.

See also p. 74

Mendip Hills.—*The Court*, Blagdon, near Bristol. Nerve and general medical cases. Matron, Miss Hallen.

See also p. xl

New Brighton.—*Convalescent Home for Women and Children*. Hon. Sec. and Treas., R. C. Lindsay, Esq., 5, Fenwick Street, Liverpool. Lady Supt., Miss L. Reed.

See also p. 66

Paignton (South Devon).—*Bay View Mount*. For convalescents and chronics. Apply Lady Supt.

See also p. 66

Pinner (Middlesex).—*St. Vincent's Open-air Hospital and School for Crippled Boys*, Eastcote. Tubercular and other joint diseases, infantile paralysis, etc.

See also p. 69

Sevenoaks.—*The Grey House*. Farm and Garden School for backward, borderline, or nervous girls of gentle birth. Hon. Lady Supt., Mrs. Pearce Clark.

See also p. 65

St. Leonards-on-Sea.—*Special Home School*, 12, Upper Maze Hill. Certified by the Board of Education for the care and training of delicate and backward children. Apply Principal.

See also p. 66

Special School for Blind and Partially Blind Children who are also Backward or

Exceptional, 22, Upper Maze Hill, St. Leonards-on-Sea. Approved by the Board of Education, for girls of all ages and boys under 8 years. Apply Principal.

See also p. 64

Torquay.—*Braddons Hill House*. Electrical treatment of all kinds. Apply Dr. Halliwell.

See also p. 79

PRINCIPAL BRITISH SPAS,

WITH INDICATIONS FOR THEIR THERAPEUTICAL EMPLOYMENT.

THE BRITISH SPA FEDERATION,

Comprising the Spas of BATH, BUXTON, CHELTENHAM, DROITWICH, HARROGATE, LEAMINGTON, LLANDRINDOD WELLS, WOODHALL, and NEW ZEALAND.

Bath (Somerset).—Sheltered from N. and N.E. winds by hills from 600 to 800 feet high; 2 hours from London. Climate mild and equable. Bath is at its busiest in the autumn, winter and spring months, but has an all-the-year-round season. A winter spa is of priceless value to any country, especially to such a country as Britain where, during the winter months, rheumatism in all its forms is particularly prevalent. During the summer there are some complaints in which Bath proves most efficacious.

Waters.—The only hot springs in Britain (120° F.) and the richest natural radio-active mineral waters in this country.

Therapeutic indications.—Specially suitable for all rheumatic and gouty conditions, skin diseases of gouty and rheumatic origin, chronic laryngitis and pharyngitis, and mucous colitis and similar conditions. A detailed list of complaints successfully treated will be sent on application.

Baths.—An extensive and thoroughly equipped bathing establishment. The Queen's Baths and the Old Royal Baths, the Royal Baths (opened 1916) and the New Wing (opened 1919) provide the latest and most approved balneo-therapeutic methods.

Bath *specializes* in the treatments for which its waters are particularly adapted: deep baths (500 gallons of natural hot radio-active water), undercurrent douching, douche massage in many forms, and intestinal lavage (Plombières douches), throat sprays and inhalation of the natural radium emanation. Particulars of the many other treatments given will be sent on request by John Hatton, Director of the Spa, Bath.

Nursing and Baths.—Lansdown Grove House (*See p. 62*).

(*See also p. xlv*).

Buxton (Derbyshire).—1000 to 1200 feet above sea-level. The highest town in the United Kingdom; 3½ hours from London; 1 hour from Manchester. Served by Midland and L. & N.W. Railways. Average rainfall 35 inches. Sunshine 1362 hours. Sheltered from east winds. Very bracing air.

Waters.—Simple, highly radio-active, natural temperature 82° F., mainly bicarbonate of calcium and magnesium ingredients. Tasteless, odourless. Chalybeate springs.

Therapeutic indications.—Gout, rheumatism, rheumatoid arthritis, sciatica, and various nervous diseases, neurasthenia, disorders of digestion, and skin diseases, malaria, mucomembranous colitis, arteriosclerosis, phlebitis, diseases of the throat and air-passages; anæmic conditions, and convalescence from prolonged illness.

Baths.—100 different treatments. All Continental treatments available. Establishments including St. Ann's Well (Pump Room), recently modernized at great cost. Open all the year round. All the latest equipment installed.

Medical Profession, etc.—Complimentary facilities granted to practising medical men and professional nurses.

Boarding Establishment.—The Buckingham (*See p. 78*).

(*See also p. xlv*).

Cheltenham (Gloucestershire).—Protected from N. and N.E. winds by the Cotswold Hills, 184 feet above sea level; 3 hours from London. Climate soft and mild. Average rainfall 30 inches.

Waters.—Of four kinds: the Fieldholme or Twin Salt Saline, containing nearly equal parts of magnesium sulphate and sodium sulphate: sold in bottles by chemists, under the name of "Chelspa," aperient water; the Lansdown or Sodium Sulphate Saline, the chief ingredients of which are sulphate and chloride of sodium, closely resembling Kissingen waters; the Pittville or Alkaline Saline, the only alkaline natural water in Great Britain, very similar in analysis to Carlsbad or Marienbad waters; and the Chadnor or Magnesium and Calcium Saline, containing a large quantity of sulphate of magnesium and a considerable amount of carbonate and sulphate of calcium.

Therapeutic indications.—The Fieldholme water is most useful in gastric hyperacidity, sthenic dyspepsia, obesity, plethora, chronic constipation, hemorrhoidal conditions, and glycosuria associated with obesity; Lansdown water for anæmic dyspeptics, skin affections and chronic gastric catarrh; Pittville water for congestion of the liver, torpid liver, biliary catarrh, gastroduodenal catarrh and gall-stones, also for mucous colitis, toxæmia, glycosuria, and catarrhal conditions of the intestinal tract; and Chadnor water for renal disorders, lumbago, myalgia, torticollis, and other forms of fibrositis.

Baths.—An excellent set of baths and douche and massage apartments at the Montpellier Baths, close to the Central Spa. All the latest baths and treatment.

(See also *p.* xlv).

Droitwich (Worcestershire).—150 feet above sea level, 2½ hours from London (Paddington), 19 miles from Birmingham, 6 from Worcester. Rainfall about 23 inches. Mean winter temperature 47° F., summer 69.9° F. The climate is excellent for invalids both in summer and winter. Moderately bracing, but well protected from N. and N.E. winds.

Waters.—The most powerful saline in the world. The brine is pumped from the triassic formation 200 feet below the ground level. Temperature 54° F., and is heated by introducing steam. It is 10 to 12 times as strong as that of the ocean (Channel), containing in every gallon 20,000 grains of saline in excess of other European waters: the waters are radio-active and radio-emanative.

Therapeutic indications.—Chronic muscular and articular rheumatism, rheumatoid arthritis, chronic articular or irregular gout, neuritis, sciatica, heart diseases, especially those of myocardium—effect similar and equal to Nauheim treatment, or the Nauheim treatment, on the most approved principles, is given if prescribed—neurasthenia, anæmia, chlorosis, some sclerotic diseases of spinal cord, dry, scaly skin diseases, e.g., chronic eczema and psoriasis. Moist eczema is contra-indicated.

Baths.—Reclining, douche, needle, vapour, swimming, Aix-douche, Nauheim baths, brine-pine or Homburg baths, etc.

Hotel.—Worcestershire Brine Baths Hotel. (See *p.* 70).

(See also *p.* xlv).

Harrogate (Yorkshire).—600 feet above sea level, 4½ hours from London. Unequalled by any Continental spa, especially for the treatment of gout and its complications. The climate is stimulating and fairly dry—bracing moorland air. Average rainfall 29 inches.

Waters.—Celebrated for the medicinal properties of its 87 springs—sulphurous, chalybeate, alkaline, and saline. 'Aquaperia' aperient mineral water is bottled from a Spring at Harrogate by Camwal Ltd. (See *p.* 135).

Baths.—There are five establishments, where nearly 100 treatments are given, including all the Continental systems and others. The staff of 200 are all medically trained, and the masseurs, etc., fully certificated. The waters are continually under scientific control by the highly qualified scientific officer on the permanent staff. Harrogate also possesses its own pathologist and bacteriologist, x-ray expert, etc.

The surrounding country is unsurpassed for beauty and interest, and the amusements and recreations are of the highest order.

Maternity Home.—The Acomb Nursing Home. (See *p.* xh).

(See also *p.* xlv).

Leamington Spa (Warwickshire).—195 feet above sea level; 98 miles from London. Equable and mild climate. Average rainfall 24 inches. Mean annual temperature 49.50. Westerly winds prevail.

Waters.—Radio-active saline springs, resembling those of Homburg, but more generally useful.

Therapeutic indications.—Muscular and articular rheumatism, gout, rheumatoid arthritis, neuralgia and neuritis, diseases arising from a plethoric condition of the chylipoietic viscera, eczema and other irritative disorders of the skin, conditions of increased vascular tension, and chronic interstitial nephritis.

Baths.—Turkish, 'whirlpool,' swimming, and electric of all kinds.

(See also *p.* xlv).

Llandrindod Wells (Radnorshire).—Situated amidst beautiful mountain and river scenery in Mid-Wales at an altitude of 750 feet above sea-level. Climate exceedingly bracing, but sheltered from east winds, and with an average rainfall of about 35 inches. About 5 hours distant from London, on the main L. & N.W. Railway about mid-way between Shrewsbury and Swansea.

Waters.—Celebrated for the variety and efficacy of its numerous medicinal springs. Saline, sulphur and radium-sulphur, magnesium, lithia saline and chalybeate. Slightly aperient and strongly diuretic.

Therapeutic indications.—Digestive disorders, gout and rheumatism, rheumatoid arthritis, neuritis and fibrositis, gall-stones and biliary stasis, renal calculus or any kidney or bladder condition requiring diuresis, and in neurasthenia or debility from overwork.

Baths.—Sulphur, immersion, needle and douche; Aix and Vichy douche and massage; Scotch douche; Nauheim; medicated baths; Fango and peat baths; whirlpool and agitation baths; almost every known form of electrical treatment by fully qualified staff.

Hotel.—Ye Wells Hotel. (See p. 79).

(See also p. xlvii).

Woodhall Spa (Lincolnshire).—50 feet above sea level. 3 hours from London. Average rainfall, 22½ inches. The air, bracing and uncontaminated, sweeping across the Lincolnshire wolds from the sea, is soothing and curative, bringing restful sleep to jaded nerves. The quiet simplicity of Woodhall Spa is in itself a distinction.

Waters.—Bromo-iodine waters, rich in the chlorides of sodium, calcium, and magnesium, with bromine and iodine.

Therapeutic indications.—Rheumatism (chronic articular and muscular), lumbago, arthritis deformans, gouty arthritis, sciatica, neuritis, paralysis, neurasthenia; injuries to joints; skin diseases, psoriasis, urticaria; diseases peculiar to women; diseases of throat and dose; liver disorders. Not only is Woodhall Spa the place to visit in cases of rheumatism, gout, or any of the diseases mentioned; but those who are suffering from overwork and nerve-strain will find it a delightful holiday resort.

Spa Baths.—Recently enlarged. Immersion, shower, undercurrent and local douches; Aix and Vichy douche massage; Nauheim, electric and Schnee baths; Dowsing radiant heat and light baths; Bergonié treatment; nose, throat, and eye mineral sprays and douches; Russian and Berthollet vapour; electric, ionic, and x-ray treatments; paraffin-wax treatment; massage and Swedish exercises. There are 60 acres of grounds surrounding the Pump Room. Particulars, apply Secretary.

(See also p. xlvii).

New Zealand Spas.—The mineral waters of New Zealand are famed both for their great variety and for their powerful therapeutic properties. Many of them are almost unique: quite unlike any European waters; others are of kinds familiar in Europe, but stronger in mineralization than the most famous Continental waters. The principal spas are:—

ROTORUA.—A first-class, well-equipped spa, with complete modern bathing establishment and limitless supply of *Sulphur waters* of two main types: alkaline sulphur, containing sodium chloride, bicarbonate, and silicate; and acid sulphur, containing sulphuric acid, and used for baths only. There are mud baths supplied from the *boiling mud springs*, corresponding to the fango treatment of Italy, and natural vapour baths. The massage and electrical department is thoroughly up to date. The whole establishment is under Government management, and skilled medical attendance is provided. As Rotorua is the centre of the thermal district, numerous minor spas are within easy reach, providing primitive but most excellent baths.

Climate and Season.—The latitude corresponds to that of the south of Spain, but the spa being 1000 ft. up, the climate is by no means hot. Season from October to May, but baths open all the year round.

Accommodation.—Several hotels and numerous boarding houses.

Access by train from Auckland or Wellington.

TE AROHA.—Hot alkaline waters of the Vichy type, but double the strength. There are comfortable baths, but this is essentially a place for drinking the waters, which are unique in their strength of sodium bicarbonate.

Climate.—Mild and sedative.

Accommodation.—Several hotels and boarding houses.

Access by train, branch from Rotorua line.

HANMER.—In the South Island: has mild sulphur baths and a bracing climate.

There are numerous smaller resorts only partly developed, with valuable *iodine saline*, *chalybeate*, *carbonic acid*, and other waters, and a choice of climate from mild subtropical to bracing Alpine.

(See also p. xlviii).

OTHER BRITISH SPAS.

Bridge of Allan (Stirlingshire).—422 miles from London. Sheltered from N. and N.E. winds by the Ochil Hills. Average rainfall 33 inches. Climate mild and equable.

Waters.—Natural saline mineral springs (Airthrey).

Therapeutic indications.—Chronic affections of the liver, stomach, and bowels, in many chest diseases, rheumatism, gout, sciatica, and in some diseases of the skin.

Baths.—Excellent suite of baths.

Bridge of Allan mineral water for internal use and as baths (*See p. 74*).

Church Stretton (Salop).—613 feet above sea level. 153 miles from London. Pure bracing air, and a generally invigorating climate. Prevailing wind, S.W. Average rainfall 33 inches.

Waters.—Said to be the purest in Great Britain.

Therapeutic indications.—Specially the 'open-air' cure of neurasthenia, for sequelæ of influenza, for insomnia, functional nervous diseases, chronic gout and rheumatism, chronic gastric and bronchial catarrh, debility from over-work, and convalescence after illness or operation.

Ilkley (Yorkshire).—Situated on the southern slope of the valley of the Wharfe. 18 miles from Harrogate. Occupying a sheltered position. Average rainfall 32 inches. Mean annual temperature, 48° F. Bracing and invigorating moorland air.

Waters.—The water supply obtained from springs is remarkably pure, bright and sparkling. Chalybeate waters. Saline.

Therapeutic indications.—Gout, rheumatism, neuritis, neurasthenia, anæmia, asthma, and bronchitis cases are benefited. The treatment adopted is that known as hydrotherapeutic.

Baths.—Complete suites of baths are to be found in the numerous establishments. Electrical, Weir-Mitchell.

Hydropathic Establishment.—Craiglands Hydropathic. (*See p. 76*).

Llangammarch Wells (Breconshire).—600 feet above sea level. 215 miles from London. Well protected from the east, and prevailing wind is S.W. Average rainfall 58 inches.

Water.—Saline, containing the chlorides of barium (6½ grains per gallon), calcium, magnesium, lithium, and sodium; the only one of its kind in the British Isles.

Therapeutic indications.—Cardiac diseases, organic and inorganic, especially affections of the myocardium due to influenza. Graves's disease, chronic muscular and articular rheumatism, osteo-arthritis, gout, sciatica, and neurasthenia.

Hotel.—Lake Hotel. (*See p. 78*)

(*See also p. 78*).

Malvern (Worcestershire).—520 feet above sea level. 122 miles from London. Air dry and bracing. Prevailing winds S.W. and W. Average rainfall 28 inches.

Waters.—Mainly spring, of remarkable purity, free from organic matter, less than 4 grains of earthy salts per gallon.

Therapeutic indications.—Gout, rheumatism, rheumatoid arthritis, neuralgia, sciatica, lumbago, dyspepsia, constipation, anæmia, bronchial, nephritic, and cutaneous diseases.

Baths.—Natural pure brine (from Droitwich), Turkish and electric baths. Vichy massage and Aix douches, Fango-di-Battaglia.

Matlock Bath (Derbyshire).—300 to 800 feet above sea level, 143 miles from London. Average rainfall 35 inches. Very sheltered.

Waters.—Thermal springs. Mild sulphated alkaline—saline waters at 68° F., containing 33 grains per gallon of salts, mainly magnesium and calcium bicarbonate, and magnesium sulphate.

Therapeutic indications.—Rheumatism, gout, rheumatoid arthritis, neuritis, neurasthenia, catarrhs (bronchial, gastric, or enteric), anæmia, cardiac asthenia, chronic diseases of the liver or kidneys, digestive and biliary disorders.

Baths.—A complete modern installation exists for the administration of all kinds of baths, douches, packs, and other hydropathic treatment, electricity, massage, inhalations, Nauheim baths, with Swedish exercises.

Matlock Bank (*Matlock station, one mile by rail from Matlock Bath*).—South-westerly aspect, and well sheltered from the north. Climate mildly bracing. Sunshine above the average. The Matlock system of hydropathic treatment is carried out in all its branches, and the principal hydros are installed with latest electric baths and appliances, including high-frequency, Dowsing radiant heat and light, Schnee four-cell, α rays, etc. They also include Turkish, Russian, plunge, medicated, and inhalation baths, Aix and Vichy douches.

Hydropathic Establishment.—Smedley's Hydropathic (*See p. 75*).

Peebles (Peebleshire, N.B.).—500 ft. above sea level. One hour from Edinburgh and 382 miles from London. Rainfall, 27 inches. Bracing climate, but sheltered from the north winds.

Waters.—The chief ingredient is chloride of sodium. They are obtained from the famous St. Ronan's Well (6 miles east).

Therapeutic indications.—The waters are specially suited to the Nauheim and Bourbon Lancy treatment of cardiac disease, dyspepsia, gout, rheumatism, and neurasthenia.

Baths.—The baths at the hydropathic are of the most modern type. Complete electrical installation and mud baths (Fango-di-Battaglia).

Hydropathic Establishment.—Peebles Hotel Hydropathic (*See p. 73*).

See also p. 72.

Ripon (Yorkshire).—120 feet above sea level. 4½ hours from London. Climate mild but bracing. Prevailing winds, W. and S.W.

Waters.—Saline sulphur water from Aldfield Spa, 4 miles distant.

Therapeutic indications.—Chronic and subacute gout, rheumatism, rheumatoid arthritis, chronic skin diseases (eczema, psoriasis, acne), catarrhs, gastric and liver derangements.

The Baths have been lately equipped with up-to-date electric apparatus.

Strathpeffer Spa (Ross-shire, N.B.).—180 to 300 feet above sea level. Sheltered from N. and N.E. winds. Prevailing wind S.W. Bracing air. Average rainfall 31 inches.

Waters.—Sulphurous and chalybeate. Sulphates the predominating salt. Have strong diuretic and mild aperient action.

Therapeutic indications.—Chronic gout and rheumatism, rheumatoid arthritis, chronic skin diseases, chronic disorders of the digestive system, chronic gastric or intestinal catarrh, sluggish portal circulation, congested liver, biliary and urinary calculi, and neurasthenia.

Baths.—Sulphurous (immersion), inhalation, peat, douche (Aix and Vichy), needle, pine, Russian, Nauheim, Plombières, radiant heat (electric), and high-frequency current.

See also p. 76.

Trefriw Wells (Carnarvonshire).—5 hours from London. The climate is bracing, the air soft, pure, and mostly of a westerly or south-westerly type.

Waters.—Two varieties: (1) The aluminous chalybeate, and (2) the sulpho-magnesian chalybeate. Used internally, and externally in the form of baths.

Therapeutic indications.—Curable forms of anæmia, nervous, debilitating and wasting diseases, rheumatism, sciatica, gout, and neuritis.

Tunbridge Wells (Kent).—400 feet above sea level, 1 hour from London. Climate is tonic and invigorating. Prevailing winds W. and S.W.

Water.—A weak non-aerated, chalybeate spring, containing 4 grains ferrous carbonate to the gallon, with sulphates and chlorides of potash, soda, and calcium.

Therapeutic indications.—Waters indicated in anæmia, chlorosis, and allied conditions.

Baths.—Immersion, douche, needle, Turkish, Russian, vapour, swimming, medicated, and electric light.

OFFICIAL AND TRADE DIRECTORY.

GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION OF THE UNITED KINGDOM.

Offices: 44, Hallam Street, Portland Place, London, W.1.

PRESIDENT: Sir Donald MacAlister, K.C.B., M.D.

MEMBERS OF THE GENERAL COUNCIL.

Adams, James Alexander, M.D.	<i>Roy. Fac. Phys. & Surg. Glasg.</i>
Barling, Sir Harry G., Bart., C.B., C.B.E., F.R.C.S.	<i>Univ. Birmingham</i>
Bennett, Norman Godfrey, B.Ch., L.D.S.	<i>Crown Nominee</i>
Bigger, Edward Coey, M.D.	<i>Crown Nominee</i>
Bolam, Robert Alfred, O.B.E., M.D., England	<i>Direct Representative</i>
Caton, Richard, C.B.E., M.D.	<i>Univ. Liverpool</i>
Champneys, Sir Francis Hy., Bart., M.D.	<i>Crown Nominee</i>
Chance, Sir Arthur Gerald, F.R.C.S.I.	<i>Roy. Coll. Surg. Ireland</i>
Connolly, Benjamin B., C.B., M.D.	<i>Apoth. Soc., London</i>
Dean, Henry Roy, M.D.	<i>Univ. Manchester</i>
Denis, Joseph Coffey, M.B.	<i>Nat. Univ. Ireland</i>
Dixon, Andrew Francis, M.B.	<i>Univ. Dublin</i>
Griffith, T. Wardrop, C.M.G., M.D.	<i>Univ. Leeds</i>
Hay, Matthew, M.D.	<i>Univ. Aberdeen</i>
Hepburn, David, C.M.G., M.D.	<i>Univ. Wales</i>
Hodsdon, Sir Jas. W. B., K.B.E., M.D., F.R.C.S.	<i>Roy. Coll. Surg. Edinburgh</i>
Hopkins, Frederick Gowland, M.A., M.B.	<i>Univ. Cambridge</i>
Howden, Robert, M.A., M.B.	<i>Univ. Durham</i>
Kidd, Leonard, M.D., Ireland	<i>Direct Representative</i>
Leathes, John Beresford, M.B., F.R.C.S.	<i>Univ. Sheffield</i>
Littlejohn, Hy. Harvey, M.B., F.R.C.S.	<i>Univ. Edinburgh</i>
MacAlister, Sir Donald, K.C.B., M.D.	<i>Univ. Glasgow</i>
Macdonald, James Alexander, M.D., England	<i>Direct Representative</i>
Mackay, John Yule, M.D.	<i>Univ. St. Andrews</i>
McVail, John Christie, M.D.	<i>Crown Nominee</i>
Magenais, Edward, M.D.	<i>Apoth. Hall, Ireland</i>
Moore, Sir John William, M.D.	<i>Roy. Coll. Phys. Ireland</i>
Moore, Sir Norman, Bart., M.D.	<i>Roy. Coll. Phys. London</i>
Newman, Sir George, K.C.B., M.D.	<i>Crown Nominee</i>
Owen, Sir Isambard, M.D.	<i>Univ. Bristol</i>
Russell, William, M.D.	<i>Roy. Coll. Phys. Edinburgh</i>
Sinclair, Thomas, C.B., M.D., F.R.C.S.	<i>Queen's Univ., Belfast</i>
Thomson, Arthur, M.A., M.B., F.R.C.S.	<i>Univ. Oxford</i>
Turner, Edward Beadon, F.R.C.S., England	<i>Direct Representative</i>
Verrall, Sir Thomas Jenner, L.R.C.P., England	<i>Direct Representative</i>
Walker, Norman Purvis, M.D., Scotland	<i>Direct Representative</i>
Waring, Holburt Jacob, C.B.E., M.S., F.R.C.S.	<i>Roy. Coll. Surg. England</i>
Wells, Sydney Russell, M.D.	<i>Univ. London</i>

REGISTRARS:

ENGLAND—Norman C. King, 44, Hallam Street, Portland Place, London, W.1.

SCOTLAND—Thomas H. Graham, O.B.E., 20, Queen Street, Edinburgh.

IRELAND—Richard J. H. Roe, 35, Dawson Street, Dublin.

TREASURERS:

Sir Norman Moore, Bart., M.D., and Holburt Jacob Waring, C.B.E., M.S., F.R.C.S.

Army Medical Service.—War Office, Whitehall, London, S.W.1. Lt.-Gen. T. H. J. C. Goodwin, K.C.B., C.M.G., D.S.O., *Director-General*.

Indian Army Medical Service.—India Office, Whitehall, S.W.1. Surg.-Gen. W. R. Edwards, C.B., C.M.G., M.D., *Director-General*.

Royal Naval Medical Department.—1, Lake Buildings, St. James' Park, S.W.1. Surg.-Rear-Admiral Sir Robert Hill, K.C.M.G., C.B., C.V.O., F.R.C.S., *Director-General*.

Ministry of Health.—Offices, Whitehall, London, S.W.1, and Wellington House, Buckingham Gate, S.W.1.

Minister, Rt. Hon. Sir Alfred Mond, Bart., M.P.; *Parliamentary Sec.*, Viscount Astor, M.P.; *Permanent Secretaries*, Sir W. A. Robinson, K.C.B., C.B.E.; Sir A. V. Symonds, K.C.B.; *Principal Assistant Secretary*, Sir F. J. Willis, K.B.E., C.B.; *Assistant Secretaries*, F. L. Turner, C.B., C. Knight, C.B., E. R. Forber, C.B.E., H. W. S. Francis, O.B.E., I. G. Gibbon, C.B.E., H. O. Stutchbury, A. B. MacLachlan, L. G. Brock, C.B., R. W. Harris, S. P. Vivian, R. B. Cross, O.B.E.; *Chief Medical Officer*, Sir George Newman, K.C.B., M.D.; *Senior Medical Officers*, G. S. Buchanan, C.B., M.D., Miss J. M. Campbell, M.D., F. J. H. Coutts, M.D., A. W. J. MacFadden, C.B., M.B., R. J. Reece, C.B., M.D., J. S. Whitaker, M.R.C.S.; *Medical Officers*, E. W. Adams, O.B.E., M.D., M. B. Arnold, M.D., Miss I. D. Cameron, M.D., J. P. Candler, M.D., T. Camwath, D.S.O., M.B., J. E. Chapman, M.R.C.S., S. A. M. Copeman, M.D., F.R.S., Miss B. M. Cunningham, M.D., A. Eastwood, M.D., J. Fairley, M.D., R. A. Farrar, M.D., A. Fuller, M.R.C.S., J. A. Glover, O.B.E., M.D., M. Greenwood, M.R.C.P., F. Griffith, M.B., J. M. Hamill, O.B.E., M.D., G. C. Hancock, M.R.C.S., F. W. Higgs, C.B.E., M.D., J. R. Hutchinson, M.D., S. P. James, M.D., A. A. Jubb, M.D., Miss F. B. Lambert, C.B.E., M.B., J. S. Low, M.B., R. Bruce Low (Jnr.), M.R.C.S., H. A. Macewen, O.B.E., M.B., G. F. McLeary, M.D., A. S. MacNalty, M.D., A. McPhail, M.B., A. T. McWhirter, M.C., M.B., E. P. Manby, M.D., G. W. Monier-Williams, O.B.E., M.C., A. C. Parsons, M.R.C.S., J. Pearce, M.D., G. Raffan, M.D., H. M. Richards, M.D., W. M. Scott, M.D., F. R. Seymour, M.D., W. V. Shaw, O.B.E., M.D., A. B. Smallman, C.B.E., D.S.O., M.D., P. G. Stock, C.B., C.B.E., M.B., E. L. Sturdee, O.B.E., M.R.C.S., Miss J. H. Turnbull, C.B.E., M.D., S. W. Wheaton, M.D., F. N. White, C.I.E., M.D., E. Wilkinson, F.R.C.S., D. J. Williamson, M.D., W. P. Yetts, O.B.E., M.R.C.S.

Government Lymph Establishment.—*Bacteriologist*, F. R. Blaxall, M.D.; *Assistant Bacteriologist*, Dr. H. S. Fremlin.

Welsh Board of Health.—Offices, City Hall, Cardiff.

Members of Board, Sir Thomas Hughes (*Chairman*), J. Rowland, C.B.E., M.V.O.; *Medical Officer*, D. L. Williams, M.C., F.R.C.S.; *Secretary*, P. Watkins.

Scottish Board of Health.—125, George Street, and 83, Princes Street, Edinburgh. *President*, Rt. Hon. R. Munro, K.C., M.P., *Secretary for Scotland*; *Vice-President*, J. W. Pratt, M.P.; *Chairman*, Sir George McCrae, D.S.O.; *Members*, Ewan Macpherson, C.B., B.A., Advocate, Sir Leslie Mackenzie, M.A., LL.D., M.D., J. C. McVail, LL.D., M.D., Sir James Leishman, Miss Muriel Ritson; *Secretaries*, John Jeffrey, Esq., John T. Maxwell, Esq.; *Medical Officers*, Lewis D. Cruickshank, M.D., G. Matheson Cullen, M.D., J. R. Currie, M.A., M.D., Thomas F. Dewar, C.B., M.D., D.Sc., Fred. Dittmar, M.A., M.D., G. R. Leighton, O.B.E., M.D., Ernest Watt, M.D., D.Sc.; *Lady Medical Officer*, Mary J. Menzies, M.B., Ch.B.

Local Government Board for Ireland.—Custom House, Dublin.

President, The Rt. Hon. the Chief Secretary to the Lord Lieutenant of Ireland, for the time being; *Vice-President*, Rt. Hon. Sir H. A. Robinson, Bt., K.C.B.; *Members of the Board*, The Under-Secretary to the Lord Lieutenant of Ireland, for the time being; E. Bourke, C.B., and E. F. Stephenson, F.R.C.S.I.; *Secretary*, A. R. Barlas, I.S.O., M.B.; *Medical Inspectors*, Dr. B. MacCarthy, Dr. R. P. McDonnell, Dr. A. D. Clinch, Dr. J. W. Bigger, Dr. N. C. Patrick, Dr. J. McCloy, Dr. W. S. Sterling Berry, O.B.E., Mrs. Florence Dillon, L.R.C.P., and Dr. J. D. MacCormack, M.C.

Lunacy Boards.—

ENGLAND & WALES—86, Victoria Street, S.W.1. *Sec.*, O. E. Dickinson, Esq.
SCOTLAND—25, Palmerston Place, Edinburgh. *Sec.*, A. D. Wood, Esq., J.P.
IRELAND—Dublin Castle. *Chief Clerk*, J. Smith, Esq.

Lord Chancellor's Visitors in Lunacy.—Royal Courts of Justice, Strand, W.C.2. *Visitors*, The Hon. John Mansfield, Barrister-at-Law; Sir James Crichton-Browne, M.D., F.R.S., LL.D.; David Nicolson, C.B., M.D., LL.D.; and the Masters in Lunacy (*ex officio*). *Sec.*, H. MacDonald; *Clerk*, W. H. Wade.

Anatomy, Inspectors of.—

LONDON—Sir Wm. Hy. Bennett, K.C.V.O., F.R.C.S., 3, Hyde Park Place, W.2.
PROVINCES—

SCOTLAND—Norman Walker, M.D., 7, Manor Place, Edinburgh.

IRELAND—Richard Francis Tobin, F.R.C.S., 28, Clare Street, Dublin.

EDUCATIONAL VACCINATION STATIONS.

In order to provide for the granting of those Special Certificates of Proficiency in Vaccination which are required to be part of the Medical Qualification for entering into contracts for the performance of Public Vaccination, or for acting as deputy to a Contractor, the following arrangements are made:—

(1) The Vaccination Stations enumerated in the subjoined list are open, under certain specified conditions, for the purposes of Teaching and Examination;

(2) The Vaccinators officiating at these Stations are authorized to give the required Certificates of Proficiency in Vaccination to persons whom they have sufficiently instructed therein.

(3) The Vaccinators whose names are printed in italic letters are also authorized to give such Certificates, after satisfactory examination, to persons whom they have not themselves instructed.

Cities and Towns having Educational Vaccination Stations.	Places used as Educational Vaccination Stations.	Vaccinators authorized to give Certificates of Proficiency in Vaccination.	Days and Hours of Attendance of the Vaccinators at Stations where periodic Courses of Instruction are given (2).
London	Westminster Hospital	A. E. Cope, M.D.,	Thursday; 10.30
	St. Thomas's Hospital	66, Belgrave Rd., S.W.1	Tuesday; 10.30
	153, Drummond St., N.W.1	<i>J. Loane, M.R.C.P.</i>	Wed.; 2
	13, Great Alle Street, E.1	13, Great Alle Street, E.1	Wed.; 10.30
	Christ Church Mission Hall, Shroton St., Marylebone	E. C. Greenwood, L.R.C.P., 1, Hanover Hse, St. John's Wood, N.W.8	Fri.; 3 (beginning in Feb. May & Nov.)
Birmingham	St. Olave's and St. John's Institute, Tooley St., S.E.1	V. A. Jaynes, M.R.C.S., 157, Jamaica Road, Bermondsey, S.E.16	Wednesday; 2 (except August)
	Royal Free Hospital, Gray's Inn Road, W.C.1	Mrs. Edith Green, M.B., B.S., 1, Raymond Bldgs., W.C.1	*
Bristol	144, Hockley Hill	W. H. Line, M.D., 144, Hockley Hill	*
Cambridge	Royal Infirmary	C. Clarke, M.D., 17, Elmdale Rd., Tyndall's Park	*
	Addenbrooke's Hospital	Dr. F. Deighton, Hills Road	*
Leeds	Leeds General Infirmary	Dr. A. T. Bacon, Westfield, Hyde Park Rd.	*
Liverpool	The School of Hygiene	W. Hanna, M.D., Public Health Dept., Dale Street	*
Manchester	St. Mary's Hosp., Whitworth Street West	Dr. A. M. Mitchell, 8, Egerton Rd., Fallowfield	*
Newcastle	The Dispensary, Nelson St.	<i>F. Hawthorn, D.S.O., M.D.</i> 10, Ellison Place	*
Sheffield	Jessop Hospital for Women	D. G. Newton, F.R.C.S., 7, Gladstone Road	*
Cardiff	University College	E. Emrys-Roberts, M.D., University College	*
Aberdeen	The Public Dispensary	Dr. T. Fraser, 16, Albyn Place	Wednesday; 3. (during med. sess.)
Dundee	Royal Infirmary	W. D. D. Small, M.D., 4, Torphichen Street	*
Edinburgh	Marshall Street Dispensary	W. G. A. Robertson, M.D., Surgeons' Hall	Wed. & Sat. 12 (during med. sess.)
	The Royal Public Dispensary		Tuesday; 3
	Livingston Memorial Disp.		Wednesday; 3
Glasgow	New Town Dispensary	Dr. H. H. Borland, 41, Circus Drive, Dennistoun	Monday; 3 (Men)
	Western Dispensary	J. L. Carstairs, M.A., M.B. 6, Sardinia Terrace	Thurs.; 12 (Women) (during med. sess.)
Belfast	The Royal Infirmary	Dr. J. McLiesh, 91, Great Victoria Street	Mon. & Thurs.; 12
Cork	The Western Infirmary	W. E. A. Cummins, M.D., 17, St. Patrick's Place	Wednesday; 11
	City of Belfast Union Infirm.		*
Dublin	Cork District Hospital	Dr. A. N. Montgomery, 45, Upper Sackville Street	Tues., Fri.; (beginning in Jan., April and Oct.)
Galway	45, Upper Sackville Street	Dr. M. J. McDonough, Flood Street	*

(a.) Candidates for Certificates should communicate with the authorized Teacher to learn the dates of his or her regular courses of instruction. * Days and hours arranged each Session.

MEDICAL AND SCIENTIFIC SOCIETIES.

- Abernethian Society—St. Bartholomew's Hospital, E.C.1.
 Æsculapian Society—Metropolitan Hospital, Kingsland Road, E.8.
 Anatomical Society of Great Britain and Ireland—Secretary, John Cameron M.D., Medical School, Middlesex Hospital, W.1.
 Association of British Postal Medical Officers—Sec., 206, Mansfield Road, Nottingham.
 Association of Medical Officers of Health—Hon. Sec., D. A. Bellios, D.P.H., 109, Queen's Road, Wimbledon, S.W.19.
 Association of Physicians and Surgeons, Lim.—Hon. Sec., Geo. Dalton, 35, Leicester Square, W.C.2.
 Association of Physicians of Great Britain and Ireland—Secretary, H. M. Fletcher, M.D., 98, Harley Street, W.1.
 Association of Public Vaccinators of England and Wales—22, Panmuir Road, S.W.19.
 Association of Surgeons—Sec., H. S. Fendlebury, F.R.C.S., 44, Brook Street, Grosvenor Square, W.1.
 Assurance Medical Society—Sec., Otto May, M.D., 47, Queen Anne Street, W.1.
 British Association for the Advancement of Science—Burlington House, W.1.
 British Dental Association—Secretary, 23, Russell Square, W.1.
 British Homœopathic Association (Incorporated)—43, Russell Square, W.C.1.
 British Medical Association—Secretary, 429, Strand, W.C.2.
 British Medical Temperance Association—Sec., 124, Harley Street, W.1.
 British Orthopædic Association—Sec., 26, St. John Street, Manchester.
 British Oto-Laryngological Society—Sec., ————
 British Society for the Study of Orthodontics—Sec., 17, Upper Wimpole Street, W.1.
 Chelsea Clinical Society—Sec., 81, Harley Street, W.1.
 Chemical Society—Burlington House, Piccadilly, W.1.
 Clinical Research Association, Lim.—Watergate House, Adelphi, W.C.2.
 Cremation Society of England—52, New Cavendish Street, W.1.
 Epsom College (Royal Medical Foundation)—Sec., 49, Bedford Square, W.C.1.
 Federation of Medical and Allied Societies—Sec., 5, Vere Street, W.1.
 Harveian Society of London—Sec., 48, Harley Street, W.1.
 Hospital Saturday Fund—Sec., 54, Gray's Inn Road, W.C.1.
 Hunterian Society—Sec., 24, Upper Berkeley Street, W.1.
 Imperial Cancer Research Fund—Examination Hall, 8-11, Queen Square, W.C.1.
 Imperial Medical Reform Union—25, New Cavendish Street, W.1.
 Infirmary Medical Superintendents' Society—Sec., Southwark Hospital, S.E.22.
 Institute of Hygiene—Sec., 33 and 34, Devonshire Street, W.1.
 Listerian Society—King's College Hospital, S.E.5.
 London and Counties Medical Protection Society, Lim.—Sec., Hugh Woods, M.D., 32, Craven Street, W.C.2.
 London Association of Medical Women—Sec., Mrs. Addison, 125, Harley Street, W.1.
 London Dermatological Society—49, Leicester Square, W.C.2.
 London Hospital Medical Society—Mile End, E.1.
 Medical Defence Union, Lim.—Sec., Dr. James Neal, 4, Trafalgar Square, W.C.2.
 Medical Officers of Schools' Association—Sec., 47, White Lion Street, E.1.
 Medical Sickness, Annuity and Life Assurance Society Lim.—300, High Holborn, W.C.1.
 Medical Society of London—11, Chandos Street, W.1.
 Medical Women's Federation—Sec., 9, Clifford Street, W.1.
 Medico-Legal Society—11, Chandos Street, W.1.
 Medico-Political Union—14, Gray's Inn Square, W.C.1.
 Medico-Psychological Association—Sec., 11, Chandos Street, W.1.
 Metropolitan Police Surgeons' Association—Hon. Sec., 160, Kennington Road, S.E.11.
 National Association for the Prevention of Tuberculosis, 20, Hanover Square, W.1.
 National Medical Union—11, Chandos Street, W.1.
 New London Dermatological Society—Sec., 64, Highbury New Park, N.5.
 Ophthalmological Society of the United Kingdom—1, Wimpole Street, W.1.
 Pathological Society of Great Britain and Ireland—University College Hosp., W.C.1.
 Pharmaceutical Society of Great Britain—17, Bloomsbury Square, W.C.1.
 Physiological Society—Sec., University College, Gower Street, W.C.1.
 Poor Law Medical Officers' Association—34, Copthall Avenue, E.C.2.
 Psycho-Neurological Society—Sec., 17, Harcourt House, Cavendish Square, W.1.
 Research Defence Society—11, Chandos Street, W.1.
 Röntgen Society—Hon. Sec., 51, Welbeck Street, W.1.
 Royal Institute of Public Health—37, Russell Square, W.C.1.
 Royal Medical Benevolent Fund—11, Chandos Street, W.1.
 Royal Sanitary Institute, with which is incorporated the Parkes Museum—90 Buckingham Palace Road, S.W.1.

Royal Society of London—Burlington House, Piccadilly, W.1.
 Royal Society of Medicine—1, Wimpole Street, W.1, incorporated by Royal Charter 1834 and Supplemental Charter, 1907, and embracing the following Sections:—
 Anæsthetic—Bæneological and Climatological—Children's Diseases—Clinical—
 Dermatological—Electro-Therapeutical—Epidemiological and State Medicine—
 Historical—Laryngological—Medical—Neurological—Obstetrical and Gynæco-
 logical—Odontological—Ophthalmological—Otolological—Pathological—Psychiatry
 —Surgical (with sub-sections of Orthopædics and Proctology)—Therapeutical and
 Pharmacological—Urological—War Section.
 Royal Society of Tropical Medicine and Hygiene—11, Chandos Street, W.1.
 School Dentists' Society—Sec., Street Lodge, Watford, Herts.
 Society for the Relief of Widows and Orphans of Medical Men—11, Chandos Street, W.1.
 Society for the Study of Inebriety—Hon. Sec., 19, Park Crescent, Portland Place, W.1.
 Society of Medical Officers of Health—1, Upper Montague Street, W.C.1.
 Society of Members of the Royal College of Surgeons of England—Sec., S. C. Lawrence
 M.B., M.R.C.S., 61, Wellington Road, Enfield.
 State Medical Service Association—Sec., 24, Upper Wimpole Street, W.1.
 Territorial Force Medical Officers' Association—37, Russell Square, W.C.1.
 Tuberculosis Society—Sec., 326, Hoe Street, Walthamstow, E.17.
 United Kingdom Police Surgeons' Association—Hon. Sec., Belle Vue House, Cheltenham.
 Wellcome Historical Medical Museum—54a, Wigmore Street, W.1.
 West London Medico-Chirurgical Society—West London Hospital, W.6.

MEDICAL AND SCIENTIFIC PERIODICALS, Etc.

Analyst—Monthly 3/- —Simpkin & Co., 2-8, Orange Street, Leicester Square, W.C.2.
 Anatomy, Journal of—Quarterly, 40/- per annum—Cambridge University Press, Fetter
 Lane, E.C.4.
 Annals of Surgery—Monthly 4/-—Cassell & Co. Lim., La Belle Sauvage, E.C.4.
 Bacteriology, Abstracts of—Six times per annum for 23/- —Cambridge University
 Press, Fetter Lane, E.C.4.
 Bacteriology, Journal of—Six times per annum, 23/- —Cambridge University Press,
 Fetter Lane, E.C.4.
 Brain—Quarterly 4/-—Macmillan & Co. Lim., St. Martin's Street, W.C.2.
 Bristol Medico-Chirurgical Journal—Quarterly 3/- ; 10/6 per annum—J. W. Arrow
 smith, Ltd., Bristol. (*See Advertisement.*)
 British Food Journal and Hygienic Review—Monthly 6d. ; 7/6 per annum—32,
 Shaftesbury Avenue, W.1.
 British Journal of Experimental Pathology—Six times per annum for 42/- —Lewis,
 136, Gower Street, W.C.1.
 British Journal of Surgery—Quarterly 12/6 net ; 42/- per annum—John Wright &
 Sons Ltd., Bristol. (*See Advertisement.*)
 British Medical Journal—Weekly 1/3 —429, Strand, W.C.2.
 Burdett's Hospitals and Charities—Yearly 15/- —28-29, Southampton Street, W.C.2.
 Caledonian Medical Journal—Quarterly 1/- —70, Mitchell Street, Glasgow.
 Cancer Research, Journal of—Quarterly, 23/- per annum—Cambridge University
 Press, Fetter Lane, E.C.4.
 Charing Cross Hospital Gazette—Quarterly, 2/6 per annum—Charing Cross Hospital,
 Chandos Street, W.C.2.
 Child, The—Monthly 2/- —Bale, 83-91, Great Titchfield Street, W.1.
 Children's Diseases, British Journal of—Quarterly 7/6 ; 25/- per annum—Adlard & Son
 and West Newman, Bartholomew Close, E.C.1.
 Clinical Journal—Weekly 6d. ; 28/6 per annum—H. K. Lewis & Co. Lim., 136, Gower
 Street, W.C.1.
 Dental Journal, British—1st and 15th, 1/- —23, Russell Square, W.C.1.
 Dental Record—Monthly, 10/6 per annum—Alston House, Newman Street, W.1.
 Dental Science, British Journal of—Monthly 6d. ; 7/6 per annum—Bale, 83-91, Great
 Titchfield Street, W.1.
 Dental Surgeon—Weekly 3d. ; 13/- per annum—Baillière, 8, Henrietta Street, W.C.2.
 Dentists' Register—Yearly 3/4—Constable, 10, Orange Street, W.C.2.
 Dermatology, British Journal of—Monthly, 4/- —H. K. Lewis & Co. Lim., 136, Gower
 Street, W.C.1.
 Dublin Journal of Medical Science (Official Organ of the Royal Academy of Medicine
 in Ireland)—Monthly, 2/6 ; 25/- net per annum—40, Lower Ormond Quay,
 Dublin. (*See Advertisement.*)
 Edinburgh Medical Journal—Monthly, 4/- net ; 40/- per annum—Oliver & Boyd,
 Tweeddale Court, Edinburgh.
 Glasgow Medical Journal—Monthly 3/- —70, Mitchell Street, Glasgow.

- Guy's Hospital Gazette—Fortnightly 6d.; 7/6 per annum—Ash & Co. Lim., Henry Street, Bermondsey, S.E.1.
- Guy's Hospital Reports—Quarterly, 12/6 net; 42/- per annum—Oxford Medical Publications, 1 & 2, Bedford Street, Strand, W.C.2.
- Heart: A Journal for the Study of the Circulation—Quarterly, 27/- per annum—Shaw & Sons, 7, Fetter Lane, E.C.4.
- Homœopathic Journal, British—Quarterly, 3/6—Bale, 83-91, Gt. Titchfield Street, W.1.
- Hospital—Weekly 2d.; 13/- per annum—28, 29, Southampton Street, W.C.2. (*See Advertisement.*)
- Hygiene, Journal of—Quarterly, 12/6—Cambridge University Press, Fetter Lane, E.C.4.
- Immunology, Journal of—Six times per annum 23/- —Cambridge University Press, Fetter Lane, E.C.4.
- Indian Medical Gazette—Monthly, Rs. 16 per annum—Thacker & Co., 2, Creed Lane, E.C.4. (*See Advertisement.*)
- Inebriety, British Journal of—Quarterly 1/- —Baillière, 8, Henrietta Street, W.C.2.
- Lancet—Weekly 1/-; 42/- per annum—423, Strand, W.C.2. (*See Advertisement.*)
- Laryngology and Otology, Journal of—Monthly 4/-; 40/- per annum—Oliver & Boyd, Tweeddale Court, Edinburgh.
- Laryngoscope, The—Monthly, 35/- per annum—Baillière, 8, Henrietta Street, W.C.2.
- London Hospital Gazette—Monthly 1/-; 10/- per annum—5, Rupert Street, E.1.
- Maternity and Child Welfare—Monthly 8d.; 7/6 per annum—Bale, 83-91, Great Titchfield Street, W.1.
- Medical Annual—Yearly, 20/- net—John Wright & Sons Lim., Bristol.
- Medical Directory—Yearly 36/- net—Churchill, 7, Great Marlborough Street, W.1.
- Medical Magazine—Monthly 1/-; 10/6 per annum—44, Bedford Row, W.C.1.
- Medical Officer—Weekly 8d.; 30/- per annum—36-38, Whitefriars Street, E.C.4. (*See Advertisement.*)
- Medical Press and Circular—Weekly 6d.; 21/- per annum—Baillière, 8, Henrietta Street, W.C.2. (*See Advertisement.*)
- Medical Register—Yearly 10/6—Constable, 10, Orange Street, W.C.2.
- Medical Review—Monthly 2/6—70, Finsbury Pavement, E.C.2.
- Medical Science, Abstracts and Reviews—Monthly, 30/- per annum—Oxford University Press, Amen Corner, E.C.4.
- Medical Temperance Review—Quarterly 6d.—Adlard & Son and West Newman, 23, Bartholomew Close, E.C.1.
- Medical Times—Monthly, 6d.—49 & 50, Watling Street, E.C.4.
- Medical World—Weekly 6d.—14, Gray's Inn Square, W.C.1.
- Medical and Dental Students' Register—Yearly 2/6—10, Orange Street, W.C.2.
- Mental Science, Journal of—Quarterly 5/-—7, Great Marlborough Street, W.1.
- Middlesex Hospital Journal—Seven issues, 3/6 per annum—140, Wardour Street, W.1.
- Midland Medical Journal—Monthly 4d.—Birmingham Printers Lim., Birmingham.
- Midwives' Roll—Yearly 21/- —Spottiswoode, 1, New Street Square, E.C.4.
- National Medical Journal—National Medical Union, 11, Chandos Street, W.1.
- Neurology and Psychiatry, Review of—30/- per annum—15, Frederick Street, Edinburgh.
- Neurology and Psychopathology, Journal of—Quarterly, 8/6 net; 30/- per annum—John Wright & Sons Lim., Bristol. (*See Advertisement.*)
- Obstetrics and Gynaecology of the British Empire, Journal of—Monthly 2/6—34, Cross Street, Manchester.
- Ophthalmology, British Journal of—Monthly, 42/- per annum—Pulman & Sons Lim., 24, Thayer Street, W.1.
- Parasitology—Quarterly 15/-—Cambridge University Press, Fetter Lane, E.C.4.
- Pathology and Bacteriology, Journal of—Quarterly, 21/- per annum—Pathological Laboratory, Museums, Cambridge.
- Pharmacology and Experimental Therapeutics, Journal of—Six times per annum for 28/- —Cambridge University Press, Fetter Lane, E.C.4.
- Physiological Abstracts—Monthly, 30/- per annum—136, Gower Street, W.C.1.
- Physiology (Experimental), Quarterly Journal of—30/- per annum—Chas. Griffin & Co. Lim., Exeter Street, W.C.2.
- Physiology, Journal of—Quarterly, 30/- per volume—Fetter Lane, E.C.4.
- Practitioner—Monthly 4/-; 42/- per annum—2, Howard Street, Strand, W.C.
- Prescriber—Monthly, 20/- per annum—6, South Charlotte Street, Edinburgh.
- Psychobiology—Six times per annum for 23/- —Cambridge University Press Fetter Lane, E.C.4.
- Psychology, British Journal of (Medical Section)—Quarterly, 25/- net per volume—Cambridge University Press, Fetter Lane, E.C.4.
- Public Health—Monthly 1/8; 21/- per annum—1, Upper Montague Street, W.C.1.
- Quarterly Journal of Medicine—Quarterly 8/6 net—Oxford University Press, Amen Corner, E.C.4.

- R.A.M.C., Journal of the—Monthly 2/- —Bale, 83-91, Great Titchfield Street, W.1.
 Radiology and Electrotherapy, Archives of—Monthly 4/- —W. Heinsmann Ltd.,
 20 Bedford Street, W.C.2.
 Röntgen Society, Journal of the—Quarterly 5/- net ; 20/- per annum—Percy Lund,
 Humphries & Co. Lim., 3, Amen Corner, E.C.4.
 Royal Dental Hospital Reports—Quarterly, 5/- per annum—Bale, 83-91, Great Titch-
 field Street, W.1.
 Royal Naval Medical Service, Journal of the—Quarterly, 20/- per annum—83-91,
 Great Titchfield Street, W.1.
 Royal Sanitary Institute, Journal of the—Six times per annum for 12/6—12, Long
 Acre, W.C.2.
 Royal Society of Medicine, Proceedings of the—Monthly 10/6 net ; 105/- per annum—
 Longmans, Green & Co., 39, Paternoster Row, E.C.4.
 School Hygiene—Quarterly, 4/6 per annum—Adlard, 23, Bartholomew Close, E.C.1.
 South African Medical Record—Fortnightly 1/3 ; 31/6 per annum—Baillière, 8,
 Henrietta Street, W.C.2.
 St. Bartholomew's Hospital Journal—Monthly 6d.—Students' Union, St. Bartholomew's
 Hospital, E.C.2.
 St. George's Hospital Gazette—5/- per annum—83-91, Great Titchfield Street, W.1.
 St. Mary's Hospital Gazette—Monthly, 10/- per annum—187, Edgware Road, W.2.
 St. Thomas's Hospital Gazette—Six times per annum for 7/6—St. Thomas's Hospital,
 S.E.1.
 St. Thomas's Hospital Reports—Yearly 8/6—7, Great Marlborough Street, W.1.
 State Medicine, Journal of—Monthly, 2/- —Bale, 83-91, Gt. Titchfield Street, W.1.
 Surgery, British Journal of—Quarterly, 12/6 net ; 42/- per annum—John Wright &
 Sons Lim., Bristol. (*See Advertisement.*)
 Surgery, Gynaecology, and Obstetrics, and International Abstract of Surgery—Monthly
 5/- ; 50/- per annum—Baillière, 8, Henrietta Street, W.C.2.
 Tropical Diseases Bulletin—Monthly 2/- —Baillière, 8, Henrietta Street, W.C.2.
 Tropical Medicine and Hygiene, Journal of—Fortnightly 1/- ; 21/- per annum—
 Bale, 83-91, Great Titchfield Street, W.1.
 Tropical Medicine and Hygiene, Year Book of—Yearly 7/6—Bale, 83-91, Great Titch-
 field Street, W.1.
 Tropical Medicine and Parasitology, Annals of—Quarterly, 22/6 per annum—
 University Press, 57, Ashton Street, Liverpool.
 Tubercle—Monthly 2/6—Bale, 83-91, Great Titchfield Street, W.1.
 Tuberculosis, British Journal of—Quarterly 1/6—Baillière, 8, Henrietta Street, W.C.2.
 (*See Advertisement.*)
 Urology, Journal of—Six times per annum for 23/- —Cambridge University Press,
 Fetter Lane, E.C.4.
 West London Medical Journal—Quarterly 1/- —23, Bartholomew Close, E.C.1.

SELECTED MEDICAL TRADES DIRECTORY.

Ambulances.

Simmons & Co., 1, 3, 5, 7, Tanner Street,
 Bermondsey, S.E.

Artificial Eyes.

Grossmith, W. R., 12, Burleigh St., W.C.2
 Halford, William, Senr., 41, Upper Tolling-
 ton Park, N.4. and 3, Upper Gloucester
 Place, Baker Street, W.1
 Pache & Son, 75, Station Street, Birming-
 ham

Artificial Limbs.

Anderson & Whitelaw Lim., 11 & 12, Broad
 St. Corner, Birmingham
 Braid, A. E. & Co. Lim., 30, Gower Place,
 Gower Street, W.C.1
 Critchley, J. & Sons, 18, Gt. George Street,
 Liverpool
 Ernst, F. G., 80 & 82, Charlotte Street,
 W.1
 Evans, A. E., 38, Fitzroy Street, W.1

Grossmith, W. R., 12, Burleigh Street,
 W.C.2

Haywood, J. H. Lim., Castle Gate,
 Nottingham

Kenney Limb Co. Lim., 45, Bedford Row,
 W.C.1

McClean, A. E. & Co., 37, Aldwych, Strand,
 W.C.2

Bandage and Antiseptic Dressing Manufacturers.

Braid, A. E. & Co. Lim., 30, Gower Place
 Gower Street, W.C.1
 Robinson & Sons Lim., Chesterfield

Dietetic Articles (Manufacturers of).

Brand & Co. Lim., Mayfair Works,
 Vauxhall, S.W.8
 Bridge of Allan Mineral Wells Co., Ltd.,
 Bridge of Allan (Waters)
 Brown, Gore & Co., 40, Trinity Square,
 E.C.3 (Gautier Frères' Brandy)
 Callard & Co., 74, Regent Street, W.1

Camwall Lim., 112, Pembroke Street, N.
(Waters)
Fry, J. S. & Sons Lim., Bristol & London
Glaxo, 155, Great Portland Street, W.1
Hugon & Co., Lim., Ogden Lane, Open-
shaw, Manchester
Ingram & Royle Lim., 45, Belvedere
Road, S.E.1 (Waters)
Nestlé & Anglo-Swiss Condensed Milk Co.,
6-8, Eastcheap, E.C.3
Oxo Lim., Thames House, E.C.4
Rattray, A. Dewar, 188, Dumbarton Road,
Partick, Glasgow (Wines and Spirits)
Valentine's Meat-Juice Co., Richmond,
Virginia, U.S.A.

Druggists (Principal Wholesale).

Allen & Hanburys Lim., 37, Lombard
Street, E.C.3, and 7, Vere Street, W.1
Alliance Drug & Chemical Co., 34, Leaden-
hall Street, E.C.3
Anasarcin Chemical Co., 22, Great Russell
Street, W.C.1
Bristol-Myers Co., Brooklyn, New York
British Colloids Lim., 22, Chienies St.,
W.C.1
Burroughs Wellcome & Co., Snow Hill
Buildings, E.C.1
Centaur Chemical Co. Lim., Bassishaw
House, Basinghall Street, E.C.2
Clayton Aniline Co. Lim., 68½, Upper
Thames Street, E.C.4
Evans Sons Lescher & Webb Lim., 60,
Bartholomew Close, E.C.1, and 56,
Hanover Street, Liverpool
Fellows Medical Mfg. Co., Incorporated,
20, Christopher Street, New York
Ferris & Co. Lim., Bristol
Fletcher, Fletcher & Co. Lim., Thane
Road, Holloway, N.7
Genatosan Lim., 12, Chienies Street, W.C.1
Giles, Schacht & Co., Clifton, Bristol
Guyot-Guenin & Son, 67, Southwark
Bridge Road, S.E.
Handford & Dawson, Harrogate
Harkness, Beaumont & Co., Junction
Bridge, Leith, Edinburgh
Harris (Philip) & Co. (1913) Lim., Edmund
Street, Birmingham
Heppell's, 164, Piccadilly, W.1
Hewlett, C. J. & Son Lim., 35-42, Char-
lotte Street, E.C.2
Hoffmann-La Roche Chemical Works
Lim., 7 and 8, Idol Lane, E.C.3
Howards & Sons Lim., Ilford, N.E.
Martindale, W., 10, New Cavendish
Street, W.1
Maw, S., Son & Sons Lim., 7-12, Alders-
gate Street, E.C.1
May, Roberts & Co. Lim., 7-13, Clerken-
well Road, E.C.1
Menley & James Lim., Menley House,
64, Hatton Garden, E.C.1
Mertens, F. H., 64, Holborn Viaduct,
E.C.1
Midgley, Chas., Lim., 5, Mayes Street,
Manchester

Newbery, F. & Sons Lim., Charterhouse
Square, E.C.1
Oppenheimer, Son & Co., Lim., 179,
Queen Victoria Street, E.C.4
Parke, Davis & Co., Beak Street, Regent
Street, W.1
Peat Products (Sphagnol) Lim., 18,
Queenhithe, Upper Thames St., E.C.4
Phillips (Chas. H.) Chemical Co., 14,
Henrietta Street, W.C.2
Quibell Bros. Lim., Newark
Reynolds & Branson Lim., 13, Briggate,
Leeds
S. P. Charges Co., St. Helens, Lancs.
Salamon & Co. Lim., Rainham
Sanagen Co. Lim., Sheppeote Lane,
S.W.11
Sapon Soaps Lim., 24-25, King William
Street, E.C.4
Savory & Moore Lim., 143, New Bond
Street, W.1
Shadforth, William, 63, Grove Road, Bow,
E.3
Southall Bros. & Barclay Lim., Birming-
ham.
Squire & Sons Lim., 413, Oxford St., W.1
Sumner, R. & Co. Lim., 40, Hanover
Street, Liverpool
Symes & Co. Lim., Liverpool
Whiffen & Sons Lim., Lombard Road,
Battersea, S.W.11
Willows, Francis, Butler & Thompson
Lim., 40, Aldersgate Street, E.C.1
Woolley, Jas., Sons & Co. Lim., Victoria
Bridge, Manchester
Wyleys Lim., Coventry
Zimmermann, Chas. & Co. (Chemicals)
Lim., 9 & 10, St. Mary-at-Hill, E.C.3

Electro-Medical, X-Ray, and Scientific Instrument Makers.

Bausch & Lomb Optical Co. Lim., 37 and
38, Hatton Garden, E.C.1
British Thomson-Houston Co., Lim., 77,
Upper Thames Street, E.C.4
Cox-Cavendish Electrical Co. Lim., Twy-
ford Abbey Works, Harlesden, N.W.10;
Show Rooms: 105, Great Portland
Street, W.1
Dean, A. E. & Co., Leigh Place, Brooke
Street, Holborn, E.C.1
Medical Supply Association Lim., 167-185,
Gray's Inn Road, W.C.1
Mottershead & Co., 7, Exchange Street,
Manchester
Newton & Wright Lim., 471-472, Hornsey
Road, N.19; Registered Offices: 72,
Wigmore Street, W.1
Rogers Electric Sales Co., 31, Craven
Street, W.C.2
Rudolph, O. C. & Beesley, 65, Margaret
Street, W.1 (Microscopes, etc.)
Sanborn Co. (London), 11, Victoria Street,
S.W.1
Schall & Son, 71-75, New Cavendish
Street, W.1
Theo & Co., 6, Hatton Garden, Liverpool
(Automatic Electric Lamps, etc.)

Motor Car Manufacturers and Agents.

Austin Motor Co. Lim., Northfield, Birmingham
 Simmons, D. H., 433 & 434, Ulster Chambers, 168, Regent Street, W.1
 Singer & Co. Lim., Coventry
 Standard Motor Co. Lim., Coventry

Opticians.

Bausch & Lomb Optical Co. Lim., 37 and 38, Hatton Garden, E.C.1
 Bruce, Green & Co. Lim., 14-18, Bloomsbury Street, W.C.1
 Newton & Wright Lim., 471-472, Hornsey Road, N.19; Registered Offices: 72, Wigmore Street, W.1
 Pache & Son, 75, Station Street, Birmingham
 Rudolph, O. C. & Beesley, 65, Margaret Street, W.1
 Sir William Crookes' Anti-Glare Glass Co. Lim. (Mr. Melson Wingate, Director), 30, Wigmore Street, W.1
 Spiller, George, Lim., 32, Wigmore Street, W.1
 Zeal, G. H., 82, Turnmill Street, E.C.1

Printers (Medical).

Cassell & Co. Lim., Ludgate Hill, E.C.4
 Wright, John & Sons Lim., Bristol

Publishers and Booksellers (Medical).

Adlard & Son and West Newman Lim., 23, Bartholomew Close, E.C.1
 Appleton, D. & Co., 25, Bedford Street, Covent Garden, W.C.2
 Arnold, Edward, 41 & 43, Maddox Street, W.1
 Baillière, Tindall & Cox, 8, Henrietta Street, W.C.2
 Bale, John Sons & Danielsson Lim., 83-91, Great Titchfield Street, W.1
 Black, A. & C., Lim., Soho Square, W.1
 Bryce, William, 54 & 54a, Lothian Street, and 15 & 16, Teviot Place, Edinburgh (Bookseller)
 Butterworth & Co., Bell Yard, Temple Bar, W.C.2
 Cambridge University Press (C. F. Clay), Fetter Lane, E.C.4
 Cassell & Co. Lim., La Belle Sauvage, Ludgate Hill, E.C.4 (and Printers)
 Churchill, J. & A., 7, Great Marlborough Street, W.1
 Constable & Co. Lim., 10, Orange Street, W.C.2
 Cornish Bros. Lim., 39, New Street, Birmingham
 Deighton, Bell & Co. Lim., Cambridge (Bookseller)
 Ellis, H. R., 9, Lovell's Court, Paternoster Row, E.C.4 (Bookseller)
 Fannin & Co. Lim., Grafton Street, Dublin
 Foyle, W. & G., 121-123, Charing Cross Road, W.C.2 (Booksellers)

Galloway, James, 3, Teviot Place, Edinburgh (Bookseller)
 Green, W. & Son Lim., St. Giles Street, Edinburgh
 Griffin, Chas. & Co. Lim., 12, Exeter Street, Strand, W.C.2
 Heinemann, William (Medical Books) Lim., 20, Bedford Street, W.C.2
 Hilton & Co., 109, College Street, Calcutta, India
 Kimpton, Henry (Hirschfeld Bros. Lim.), 263, High Holborn, W.C.1
 Lewis, H. K. & Co. Lim., 136, Gower Street, 24 & 28, Gower Place, W.C.1
 Lippincott, J. B. Co., 16, John Street, Adelphi, W.C.2
 Livingstone, E. & S., 17, Teviot Place, Edinburgh
 Longmans, Green & Co., 39, Paternoster Row, E.C.4
 Maclehose, Jackson & Co., 73, West George Street, Glasgow
 Macmillan & Co. Lim., St. Martin's Street, W.C.2
 Mayne, Boyd & Son Lim., Belfast
 Methuen & Co. Lim., 36, Essex Street, W.C.2
 Murray, John, 50a, Albemarle Street, W.1
 Nisbet, Jas. & Co. Lim., 22, Berners Street, W.1
 Oliver & Boyd, Tweeddale Court, Edinburgh
 Oxford Medical Publications (Henry Frowde and Hodder & Stoughton), 1 & 2, Bedford Street, Strand, W.C.2
 Oxford University Press (Humphrey Milford), Amen Corner, E.C.4
 Pulman, Geo. & Sons Lim., 24, Thayer Street, W.1
 Putnam's, G. P., Sons, Lim., 24, Bedford Street, W.C.2
 Saunders, W. B. Co., Lim., 9, Henrietta Street, W.C.2
 Scientific Press Lim., 28 and 29, Southampton Street, W.C.2
 Shaw & Sons, 7-9, Fetter Lane, E.C.4
 Sherratt & Hughes, University Press, 34, Cross Street, Manchester
 Simpkin, Marshall, Hamilton, Kent & Co. Lim., Stationers' Hall Court and Paternoster Row, E.C.4
 Thacker, W. & Co., 2, Creed Lane, E.C.4 (Thacker, Spink & Co., Calcutta)
 University of London Press Lim., 18, Warwick Square, E.C.4
 Wright, John & Sons Lim., Bristol (and Printers); London Depot, Stationers' Hall Court, E.C.4

Shelters for Open-air Treatment.

Black, Thos. & Co., 25, Cathcart Street, Greenock (Tents, etc.)
 Hobson, J. T. & Co., Bedford

Surgical Instrument and Appliance Manufacturers.

Alexander & Fowler, 104 and 106, Pembroke Place, Liverpool

Allen & Hanburys Lim., 48, Wigmore Street, W.1
 Anderson & Whitelaw Lim., 11 & 12, Broad St. Corner, Birmingham
 Arnold & Sons, Giltspur Street, E.C.1
 Ash. Claudius Sons & Co. Lim., 5-12, Broad Street, Golden Square, W.1
 Associated Surgical Appliance Makers Lim., 37, Manchester Street, W.1
 Bailey, W. H. & Son, 38, Oxford Street, W.1 and 2, Rathbone Place, W.1
 Beatson, Clark & Co. Lim., Rotherham (Spitting Flasks)
 Braid, A. E. & Co. Lim., 30, Gower Place, Gower Street, W.C.1
 Brown & Son, Wedmore Street, Holloway, N.19 (Water Still).
 Browne & Sayer, 30, Highbury Place, N.5
 Coxeter & Son, 171, Pancras Road, N.W.1
 Critchley, J. & Sons, 18, Great George Street, Liverpool
 Cuxson, Gerrard & Co. Lim., Oldbury, Birmingham
 Delamotte (A. Plisson, Sucr.), 68, Rue J. J. Rousseau, Paris
 Dental Manufacturing Co. Lim., Alston House, Newman Street, W.1
 Domen Belts Co. Lim., 456, Strand, W.C.2
 Down Bros. Lim., 21 & 23, St. Thomas's Street, S.E.1
 Druipier & Fils, 41, Rue de Rivoli, Paris
 Elbard Patents Co., 40, York Road, King's Cross, N.1 (Safety Chambers)
 Ernst, F. G., 80 & 82, Charlotte Street, W.1
 Evans, A. E., 38, Fitzroy Street, W.1
 Ferris & Co. Lim., Bristol
 Gardner, J. & Son, 32, Forrest Road, Edinburgh
 Gloucestershire Surgical Appliances Co. (Props., Gloucestershire Aircraft Co., Lim.), 1, Belle Vue Lawn, London Road, Cheltenham
 Grossmith, W. R., 12, Burleigh Street, W.C.2
 Harris (Philip) & Co. (1913) Lim., Edmund Street, Birmingham
 Hawksley & Sons, 357, Oxford Street, W.1
 Haywood, J. H. Lim., Castle Gate, Nottingham
 Hearson, Chas. & Co. Lim., 235, Regent Street, W.1 (Incubators)
 Holborn Surgical Instrument Co. Lim., 26, Thavies Inn, E.C.1

Holden Bros., 3, Harwood Place, Hanover Square, W.1 (Footwear)
 Holland & Son, 46, South Audley Street, W.1 (Foot Supports)
 Hospitals Contracts Co. Lim., 25-35, Mortimer Street, W.1
 Marr Stethoscope Syndicate, 23, Reynell Road, Longsight, Manchester
 Maw, S., Son & Sons Lim., 7-12, Aldersgate Street, E.C.1
 Mayer & Phelps, 59 & 61, New Cavendish Street, W.1
 Medical Supply Association Lim., 167-185, Gray's Inn Road, W.C.1
 Millikin & Lawley, 165, Strand, W.C.2
 Montague, J. H., 69, New Bond Street, W.1
 Reynolds & Branson Lim., 13, Briggate, Leeds
 Rudolph, O. C. & Beesley, 65, Margaret Street, W.1
 Salmon Ody Lim., 7, New Oxford Street, W.C.1 (Trusses)
 Sanborn Co. (London), 11, Victoria Street, S.W.1
 Sumner, R. & Co. Lim., 40, Hanover Street, Liverpool
 Surgical Manufacturing Co., Lim., 83-85, Mortimer Street, W.1
 Tintometer (The) Lim., Salisbury
 Vickers Limited, Vickers House, Broadway, Westminster, S.W.1
 Weiss, John & Son Lim., 287, Oxford Street, W.1
 Woolley, Jas. Sons & Co. Lim., Victoria Bridge, Manchester
 Young, Arch. & Son, 57-61, Forrest Road, Edinburgh

Thermometer Manufacturers.

Zeal, G. H., 82, Turnmill Street, E.C.1

Vaccine Lymph.

Dr. Doucet's Calf Lymph. Sole Agents for Great Britain and Ireland: Archd. Young & Son, 57-61, Forrest Road, Edinburgh
 Government Lymph Establishment, at Colindale Avenue, The Hyde, N.W.9. Lymph is supplied, free of charge, to Public Vaccinators, on application to the Clerk

NOTE BOOK.

It is easier to make a note of a thing than to remember *where* the note was made. If entered in the following pages any note can be immediately found when required.

1921

JANUARY.	
S	* 2 91833 301
M	* 3101734 81
Tu	* 4111835 *
W	* 5121936 *
Th	* 6132037 *
F	* 7142138 *
S	* 8152239 *

NOTES.

Copy here any formula or fact you wish
to keep for reference.

1921

FEBRUARY.	
S	* 51830 27
M	* 71431 28
Tu	* 1 81532 *
W	* 2 91633 *
Th	* 3101734 *
F	* 4111835 *
S	* 5121936 *

WRIGHT'S MEDICAL PRACTITIONER'S

"CARD INDEX" SYSTEM for ACCOUNT KEEPING.

Comprising, No. 1: Visiting List, Case Record, and Prescription Card; No. 2: Ledger Card; and a set of coloured Guide Cards. Size of Cards 8 in. x 5 in. Also well-made handsome Cabinets, in polished oak, with brass fittings, having one or two drawers, as desired.

JOHN WRIGHT & SONS LTD., PUBLISHERS, BRISTOL.

Full Illustrated Prospectus, with prices, on application.

1921

MARCH.	
S	* 6 13 20 27
M	* 7 14 21 28
Tu	1 8 15 22 29
W	2 9 16 23 31
Th	3 10 17 24 31
F	4 11 18 25 *
S	5 12 19 26 *

NOTES.

1921

APRIL.	
S	* 3 10 17 24
M	* 4 11 18 25
Tu	* 5 12 19 26
W	* 6 13 20 27
Th	* 7 14 21 28
F	1 8 15 22 29
S	2 9 16 23 30

THE CHARTER OF
DR BARNARDO'S HOMES.

IS
"NO DESTITUTE CHILD EVER REFUSED ADMISSION."

HEAD OFFICES:—13-26 STEPNEY CAUSEWAY, LONDON, E. 1

See Advertisement, p. xliii.

1921

MAY.	
19	1 8 13 22 29
21	2 9 16 23 30
23	3 10 17 24 31
25	4 11 18 25 *
27	5 12 19 26 *
29	6 13 20 27 *
31	7 14 21 28 *

NOTES.

1921

JUN.	
25	* 3 12 19 26
27	* 5 14 21 28
29	* 7 16 23 30
31	1 8 15 22 29
1	2 9 16 23 30
3	3 10 17 24 *
5	4 11 18 25 *

GEORGE SPILLER Ltd. *Estab. 1874.*

Surgeons' Opticians, Patentees & Manufacturers,

— GOLD MEDAL, 1913 —

32 WIGMORE STREET, LONDON, W.1

See Advertisement, page xxv.

Phone: Mayfair 636, 648.

1921

JULY.	
S	* 810 17 24 31
M	* 411 18 35 *
Tu	* 312 19 25 *
W	* 613 20 27 *
Th	* 714 21 28 *
F	1 815 22 29 *
S	2 916 23 31 *

NURSES.

Note whether Midwifery or Sick Nurses,
their terms and addresses.

1921

AUGUST.	
S	* 714 21 28 *
M	1 815 22 29 *
Tu	2 916 23 30 *
W	3 1017 24 31 *
Th	4 1118 25 *
F	5 1219 26 *
S	6 1320 27 *

The FRENCH NATURAL MINERAL WATER

VICHY-CÉLESTINS

— FOR —

GOUT, RHEUMATISM, and LIVER COMPLAINTS.

See Advertisement, page xxix.

1921

SEPTEMBER.	
S	* 411 18 25
M	* 5 12 19 36
Tu	* 6 13 20 27
W	* 7 14 31 38
Th	1 8 15 22 39
F	2 9 16 23 30
S	3 10 17 24 *

ADDRESSES (PRIVATE).

1921

OCTOBER.	
S	* 3 9 16 23 30
M	* 8 10 17 24 31
Tu	* 4 11 18 25 *
W	* 5 12 19 26 *
Th	* 6 13 20 27 *
F	* 7 14 21 28 *
S	1 8 15 22 29 *

BISEDIA

See full announcement on page liv.

An Elegant and Effective Preparation for
GASTRO-INTESTINAL
DISTURBANCE COMPLICATED
WITH VOMITING.

GILES, SCHACHT & CO., CLIFTON, BRISTOL.

1921

NOVEMBER.	
S	* 6132027
M	* 7142128
Tu	1 6152229
W	2 9162330
Th	3 101734 *
F	4 111835 *
S	5 121936 *

NOTES.

1921

DECEMBER.	
S	* 4111825
M	* 5121926
Tu	* 6132027
W	* 7142128
Th	1 8152229
F	2 9162330
S	* 10173431

Dr. Doucet's Celebrated CALF LYMPH

Prepared under the most minute aseptic precautions and Government supervision at the

**Institut de Vaccine Animale,
8 Rue Ballu, PARIS.**

The bacterial purity of this Lymph is, therefore, absolutely assured. Extensively used on the Western Front during the War, and in Scotland during the re-vaccination scheme of 1920.

Small Tubes	1-2 doses	10d. ea.	8/- doz.
Large Tubes	6-10 "	1/6 "	15/- "
Collapsible Tubes, screw stoppered	30-40 "	4/- "	45/- "

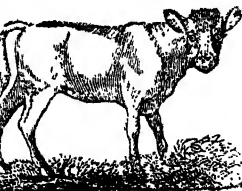
Including and Post, 2d.

Sole Agents for Gl.

Britain & Ireland:

ARCHD. YOUNG & SON, 57-61 Forrest Rd., Edinburgh

Telegrams—"BANDAGE, EDINBURGH."



Telephone—CENTRAL 669.

Classified Index to Advertisements

ACCOUNT BOOKS AND CARD INDEX SYSTEM (MEDICAL)—

Reynolds & Branson Ltd.	.. ..	xxviii
Wright, John & Sons Ltd.	.. ..	20, 601

AMBULANCES AND STRETCHERS—

Simmons & Co.	125
---------------	-------	-----

ARTIFICIAL LIMBS, EYES, Etc.—

Anderson & Whitelaw Ltd.	.. ..	100
Critchley, J. & Sons	.. ..	118
Fraser, F. G. . . . .	.. ..	116
Evans, A. E. . . . .	.. ..	110
Gardner, J. & Son	.. ..	118
Grossmith, W. R. . . . .	.. ..	110
Hallford, Wm. (Eyes)	.. ..	125
Kenney Limb Co. Ltd.	.. ..	118
Pache & Son (Eyes)	.. ..	122
Weiss, John & Son Ltd.	.. ..	126

ASSURANCE ADVICE—

Tidswell, Ernest, M.A., F.F.F.	6
--------------------------------	-------	---

ASSURANCE OFFICES, Etc.—

Australian Mutual Provident Society	.. ..	11
Britannic Assurance Co. Ltd.	.. ..	8
Co-operative Insurance Society Ltd.	.. ..	10
Eagle Star and British Dominion Insurance Co. Ltd.	.. ..	9
General Life Assurance Co.	.. ..	10
Prudential Assurance Co. Ltd.	.. ..	11
Tidswell, Ernest, M.A., F.F.F., Life Assurance Consultant	.. ..	6
Wesleyan and General Assurance Society	.. ..	8
Yorkshire Insurance Co. Ltd.	.. ..	2

ASYLUMS—(see "Mental Institutions", etc.)

AUCTIONEERS, ESTATE AGENTS, AND SURVEYORS—

Elliot, Son & Boyton	xvi
----------------------	-------	-----

BATHS—(see "Hydro-Therapeutic Establishments", etc.)

BOOK ANNOUNCEMENTS—

(see Index to Books and Periodicals, with Authors' names, page 614.)

BOOKSELLERS (MEDICAL)—

Bryce, Wm.	.. ..	14
Deighton, Bell & Co. Ltd.	.. ..	15
Hills, B. R. . . . .	.. ..	16
Joyce, W. & G. Ltd.	.. ..	20
Galloway, James	.. ..	15
Lewis, H. K. & Co. Ltd.	.. ..	22, 23

BOOTS AND SHOES—

Holten Bros.	.. ..	124
Holland & Son	.. ..	122

BRANDIES, WINES, SPIRITS, Etc.

Brown, Gore & Co., Brandie	.. ..	xxviii
Gautier Freres' Brandies	.. ..	xxviii
Rattray, A. Dewar, Whisky	.. ..	xxviii

BUILDINGS (PORTABLE, Etc.)—

Hobson, J. T. & Co. (Revolving Shelters)	124
--	-----

CARD INDEX SYSTEM AND CABINETS FOR MEDICAL ACCOUNTS.—

Reynolds & Branson Ltd.	.. ..	xxviii
Wright, John & Sons Ltd.	.. ..	601

CHEMICAL PREPARATIONS, DISINFECTANTS, Etc.—

Allen & Hanburys Ltd.	.. ..	132, 133
Alliance Drug & Chemical Co.	.. ..	129
Anarsarin Chemical Co.	.. ..	140
Bristol-Myers Co.	.. ..	xxxii
British Colloids Ltd.	.. ..	xxxvi
Centaur Chemical Co. Ltd.	.. ..	144
Clayton Aniline Co. Ltd.	.. ..	130
Crookes' Laboratories	.. ..	xxxvi
Evans Sons Lescher & Webb Ltd.	.. ..	xxxvii
Fellows Medical Mfg. Co., Inc.	.. ..	xxxix
Ferris & Co. Ltd. Back End Papers and	139	
Fletcher, Fletcher & Co. Ltd., Endolytic		
Tubes for Urine Testing	.. ..	126
Genatosan Ltd.	.. ..	131
Giles, Schacht & Co.	.. ..	liv, 605
Handford & Dawson	.. ..	144
Harkness, Beaumont & Co.	.. ..	136
Heppell's	.. ..	xxxvi
Hewlett, C. J. & Son Ltd.	.. ..	112
Hoffmann-La Roche Chemical Works Ltd.	.. ..	xxxiv, xxxv
Kerol Disinfectants and Antiseptics	.. ..	11
Kolyvos Incorporated, Dental Cream	.. ..	127
May, Roberts & Co. Ltd.	.. ..	xxvii
Menley & James Ltd.	.. ..	1
Mertens, F. H. (Clin. Laboratories, Paris)	143	
Oppenheimer, Son & Co. Ltd.	.. ..	xxxix
Parke, Davis & Co.	.. ..	xxvi
Pest Products (Splaguol) Ltd.	.. ..	xxxvi
Phillips, Chas. H., Chemical Co.	.. ..	112
Quibell Brothers Ltd., Disinfectants	.. ..	ii
Reliance Lubricating Oil Co. Ltd., Disinfectants, etc.	.. ..	115
Reynolds & Branson Ltd.	.. ..	xxviii
Rigollet's Mustard Leaves	.. ..	xxxviii
Salamon & Co. Ltd.	.. ..	146
Sapon Soaps Ltd.	.. ..	xxxviii
Shadforth, Wm. (Prescription Service)	.. ..	144
Southall Bros. & Barclay Ltd.	.. ..	137
S. P. Charges Co., Sulphaguan	.. ..	146
Sumner, R. & Co. Ltd.	.. ..	vii, x
Symes & Co. Ltd.	.. ..	146
Tamar Indian Grillon	.. ..	xxxviii
Valentine's Meat-Juice Co.	.. ..	xlix
Whiffen & Sons Ltd.	.. ..	140
Willows, Francis, Butler & Thompson Ltd.	145	
Woolley, James, Sons & Co. Ltd.	.. ..	136
Wyleys Ltd.	.. ..	138
Zimmermann, Chas. & Co. (Chemicals) Ltd.	141	

DENTAL APPLIANCES—

Ash, Claudius, Sons & Co. Ltd.	.. ..	127
Dental Manufacturing Co. Ltd.	.. ..	126
Kolyvos Incorporated, Dental Cream	.. ..	127

DIABETIC PREPARATIONS—

Callard & Co.	.. ..	134
Sanagen Co. Ltd.	.. ..	135

EDUCATIONAL INSTITUTIONS, SCHOOLS, TUTORS, Etc.—

Barnardo's (Dr.) Homes ..	xliii, 602
Boulton, Miss (Lip-reading) ..	64
Brooklands, St. Leonards-on-Sea, Residential School for Blind, Delicate, or Backward Children ..	64
Chartered Society of Massage and Medical Gymnastics, W. 1 ..	61
Colthurst House School for Epileptic Boys, Warford ..	67
Grey House, Sevenoaks (Farm and Garden School for Backward Girls) ..	65
Normansfield, Hampton Wick (Mentally Deficient) ..	67
Royal Albert Institution, Lancaster (Feeble Minded Children) ..	67
Schelle, A. C. (Stammering) ..	64
St. Paul's House, for Delicate, Backward Girls, St. Leonards-on-Sea ..	66
St. Vincent's Open-Air Hospital and School for Crippled Boys, Pinner ..	69
Stoke Park Colony, Bristol (Mentally Defective Children) ..	65
Swedish Institute and Clinic, London ..	60

ELECTRO-MEDICAL APPARATUS—

Cox-Cavendish Electrical Co. Ltd. ..	xii, xlii
Dean, A. E. & Co. ..	xiv
Medical Supply Association Ltd. ..	104, 105
Motterhead & Co. ..	xvii
Rogers Electric Sales Co. (Great Britain) ..	107
Theo & Co., Lamps, etc. ..	xv

ENGRAVERS—

Art Reproduction Co. Ltd. ..	13
Swain, John & Son Ltd. ..	12

FOODS, MILKS, Etc.—

Brand & Co. Ltd., Beef Essence, etc. ..	xxxii
Callard & Co., Diabetic Foods, etc. ..	184
Fry's Cocoa ..	Front End Paper
Glaxo ..	2
Hugon & Co. Ltd. ..	xxxiii
Lactomaltine (Harkness, Beaumont & Co.) ..	186
Nestlé & Anglo-Swiss Condensed Milk Co. ..	xxx
Oxo Ltd. ..	iii
Sanagen Co. Ltd., Nerve Food, etc. ..	185
Valentine's Meat-Juice Co. ..	xlix
Vitafer (Southall) ..	187
Vitmar (Callard) ..	184

FUNCTIONAL NERVOUS DISORDERS—

Beauworth Manor, Alresford ..	60
Kenlaw House, Colinsburgh, Fife ..	79

HEALTH RESORTS—(see "Hydro-therapeutic Establishments, Spas", etc.)

HOMES FOR INVALIDS—

Acorn Nursing Home, Maternity ..	xli
Barnardo's (Dr.) Homes ..	xliii, 602
Bay View Mount, Paignton ..	66
Beauworth Manor, Alresford (Nerves) ..	60
Brooklands, St. Leonards-on-Sea, Residential School for Blind, Delicate, and Backward Children ..	64
Bruton House, Lancaster (Feeble Minded Children) ..	67
Collingwood, Cheltenham Spa (Nursery Home) ..	66
Convalescent Home for Women and Children, New Brighton ..	66
Co-operative Sanatorium, Billericay ..	67
Court, The, Blagdon, near Bristol ..	xi
David Lewis Colony, Warford (Epileptic) ..	67
Empire Nursing Home, S.W. ..	65
Grey House, Sevenoaks (Farm and Garden School for Backward Girls) ..	65

HOMES FOR INVALIDS—continued.

Kenlaw House, Colinsburgh, Fife (Functional Nervous Disorders) ..	79
Kenley House, Kenley, Surrey ..	xlii
Lansdown Grove House, Bath ..	62
New Lodge, Billericay (Epilepsy and Mental) ..	67
Newlands House, London (Private Mental Hospital) ..	96
Normansfield, Hampton Wick (Mentally Deficient) ..	67
Royal Albert Institution, Lancaster (Feeble Minded Children) ..	67
St. Paul's House, St. Leonards-on-Sea (Backward Girls) ..	66
Stoke Park Colony, Stapleton, Bristol (Mentally Defective Children) ..	65

HOSPITALS, MEDICAL SCHOOLS—

Brompton Hospital for Consumption and Diseases of the Chest ..	56
Guy's Hospital ..	50
Hospital for Sick Children, W.C. ..	52
London Lock Hospitals ..	53
Middlesex Hospital Medical School ..	49
Radium Institute, London ..	74
Royal College of Surgeons, Edinburgh ..	57
Royal Dental Hospital, London ..	58
Royal Eye Hospital ..	56
St. John's Skin Hospital, London ..	52
St. Thomas's Hospital Medical School ..	51
St. Vincent's Open-Air Hospital and School for Crippled Boys ..	69
University of Aberdeen ..	57
— Bristol ..	54
— Durham ..	55
— Liverpool ..	57
Westminster Hospital Medical School ..	53

HOTELS AND BOARDING ESTABLISHMENTS—

Bournemouth, Branksome Tower Hotel ..	xlii
Buxton, The Buckingham Boarding Establishment ..	78
Crowborough, Crest Hotel ..	78
Droitwich, Worcestershire Brine Baths Hotel ..	70
Falmouth, Falmouth Hotel ..	79
Llandrindod Wells, Ye Wells Hotel ..	79
Llangammarch Wells, Lake Hotel ..	78
Newcastle, Co. Down, Slieve Donard Hotel ..	77
Southport, Prince of Wales Hotel ..	78
— Royal Hotel ..	78
Trenezze, Lake Como, Hotel Bazzoni et du Lac Villa Erminia, Belvedere, etc. ..	76

HYDRO-THERAPEUTIC ESTABLISHMENTS, BATHS, SPAS, HEALTH RESORTS, MEDICAL ELECTRICITY, RADIANT HEAT, RADIUM, Etc.—

Bath Spa ..	xliv
— Lansdown Grove House ..	62
Birmingham, City Hydropathic and Massage Establishment ..	72
Bridge of Allan Spa ..	74
British Spa Federation ..	xliv-xlviii
Buxton Spa ..	xliv
Caterham, Caterham Sanitarium and Surrey Hills Hydro ..	78
Cheltenham Spa ..	xlv
Dowsing Radiant Heat Treatment ..	71
Droitwich Brine Baths Spa ..	xlv
Harrogate Spa ..	xlvi
Ilkley, Craiglands Hydro ..	76
Leamington Spa, Royal ..	xlvi
Llandrindod Wells Spa ..	xlvii
Llangammarch Wells ..	78
London, Radium Institute ..	74

	PAGE		PAGE
HYDROS, ETC.—continued.		MENTAL INSTITUTIONS, ETC.—continued.	
Matlock, Smedley's Hydro	75	Hampstead, Glasnevin, and Highfield,	
New Zealand Spas	xlviii	Drumcondra, Dublin	94
Peebles	72	Haydock Lodge, Newton-le-Willows ..	81
— Hotel Hydro	73	Holloway Sanatorium, Virginia Water ..	88
Southport, Kenworthy's Hydro	78	James Murray's Royal Asylum, Perth ..	82
— Smedley Hydro	72	Kingsdown House, Box, near Bath ..	85
Strathpeffer Spa	76	Laversock House, near Salisbury ..	93
Torquay, Dr. Halliwell	79	Lawn, Lincoln	96
Woodhall Spa	xlvii	London County Mental Hospital, Claybury	95
ILLUSTRATIONS—		Millfield, York	92
Art Reproduction Co. Ltd.	13	Moulton Park, Northampton	83
Swain, John & Son Ltd.	12	New Saughton Hall, Polton, N.B. ..	84
INEBRIATES (HOMES FOR)—		Newlands House, London	96
Ashford, near Staines	71	Normansfield, Hampton Wick	67
Dalrymple House, Rickmansworth ..	71	Northumberland House, N.	87
Hamond Lodge, Terrington St. Clement ..	71	Northwoods House, Winterbourne ..	90
Island of Three, West Highlands (Farm-		Otto House, West Kensington, W. ..	87
house)	71	Peckham House, Peckham, S.E. ..	95
Norwood Sanatorium, Beckenham Park ..	70	Pleasance, The, York	86
Temple Lodge, Torquay	71	Plympton House, South Devon	90
LABORATORIES—		Portsmouth Corporation Mental Hospital	94
Laboratories of Pathology and Public		Retreat, near Armagh	86
Health, London	58	Retreat, York	92
LIBRARIES (MEDICAL AND		Royal Albert Institution, Lancaster	67
SCIENTIFIC)—		Shattisbury House, Formby-by-Sea ..	82
Ellis, H. R.	16	Silver Birches, Epsom	92
Lewis, H. K. & Co. Ltd.	22	Springfield House, near Bedford ..	93
LIFE ASSURANCE ADVICE—		St. Andrew's Hospital, Northampton ..	83
Tidswall, Earnest, M.A., F.F.I. ..	6	St. George's Retreat, Burgess Hill ..	94
LIP-READING—		St. Luke's Hospital, W.I.	61
Doulbea, Miss	64	St. Patrick's Hospital, Dublin	80
MASSAGE, EXERCISES, Etc.		Stoke Park Colony, Bristol (Children) ..	65
Associated Male Nurses and Masseurs,		Stretton House, Church Stretton ..	85
London	63	Three Counties Mental Hospital, Arlesey	91
Chartered Society of Massage and Medical		Throxenby Hall, near Scarborough ..	92
Gymnastics, W.I.	61	The Brook Villa, Liverpool, E.	92
City Hydropathic and Massage Establish-		Uplands, Macclesfield	96
ment, Birmingham	72	Warneford, The, Oxford	89
Swedish Institute and Clinique, London..	60	West Sussex County Mental Hospital ..	94
MEDICAL AGENTS AND SOCIETIES—		Wye House Asylum, Buxton	96
London & Counties Medical Protection		MICROSCOPES AND APPARATUS	
Society Ltd.	59	FOR PHOTOMICROGRAPHY	
Medical Defence Union Ltd.	58	AND BACTERIOLOGY—	
MENTAL INSTITUTIONS, HOS-		Bausch & Lomb Optical Co. Ltd. ..	iii
PITALS, AND HOMES—		Hearson, Chas. & Co. Ltd., Bacteriological	
Ashwood House, Kingswinford	90	Apparatus	125
Bailbrook House, Bath	93	Millikin & Lawley	122
Barwood House, Gloucester	90	Rudolph (O.C.) & Beesley	xvii
Bethlem Royal Hospital, S.E.	80	MINERAL WATERS, Etc.—	
Bootham Park, York	96	Bridge of Allan Water	74
Boreatton Park, Baschurch	88	Camwal Ltd., 'Aguaperia' Water ..	135
Branton House, Lancaster	67	Ingram & Royle Ltd., 'Vichy-Célestins'	
Bryn-y-neuadd Hall, Llanfairfechan ..	83		xxix, 604
Bucks Mental Hospital, Stone, Aylesbury		MOTOR CARS AND ACCESSORIES—	
Camberwell House, S.E.	97	Austin Motor Co. Ltd., Cars	99
City of London Mental Hospital, Dartford		Reliance Lubricating Oil Co. Ltd., Oils..	145
Clarence Lodge, Clapham Park, S.W. ..	89	Simmons, D. H., Cars	xviii
Co-operative Sanatorium, Billerica ..	67	Singer & Co. Ltd., Cars	xix
Copple, The, Nottingham	84	Standard Motor Co. Ltd., Cars	98
Cornwall Mental Hospital, Bodmin ..	95	NURSES' INSTITUTIONS—	
Coton Hill Mental Hospital, Stafford ..	95	Hyde Park Nursing Association, W.2 ..	62
East Sussex County Mental Hospital ..	87	Lansdown Grove House, Bath	62
Exeter City Mental Hospital	96	Liverpool Male and Female Nurses'	
Grange, The, Rotherham	89	Institution	86
		Male Nurses' Association, London ..	63
		New Mental Nurses' Co-operation, London	64
		Norfolk Square Nursing Association,	
		London	62
		Nurses' Association, London	64
		Retreat, York (Mental Nurses)	92
		St. Luke's Hospital, W.I.	61

OPTICIANS (DISPENSING & MANUFACTURING)—

Bausch & Lomb Optical Co. Ltd.	..	iii
Bruce, Green & Co. Ltd.	..	116
Pache & Son	..	122
Sir William Crookes' Anti-Glare Glass Co. Ltd. (Mr. Nelson Wingate, Director)	..	123
Spiller, George, Ltd.	..	xxv, 603

PUBLISHERS—(see also Index to Books and Periodicals, page 614)

Adlard & Son & West Newman Ltd.	..	xvii
Arnold, Edward	..	17, 20
Arrowsmith, J. W. Ltd.	..	48
Baillière, Tindall & Cox	17, 19, 20,	21, 45, 47
Bale, J., Sons & Danielsson Ltd.	..	19, 27
Black, A. & C. Ltd.	..	26
Butterworth & Co.	..	19
Cassell & Co. Ltd.	..	28
Churchill, J. & A.	..	24, 25
Graham & Heslop	..	xvi
Heinemann, Wm. (Medical Books) Ltd.	..	33
Hilton & Co.	..	16
Kimpton, Henry	..	31
Lewis, H. K. & Co. Ltd.	18, 20, 22,	23
Littlebury Bros.	..	20
Livingstone, E. & S.	..	33
Macmillan & Co. Ltd.	..	29
Mayne, Boyd & Son Ltd.	..	18
Medical Publishing Co. Ltd.	..	17
Oxford Medical Publications	..	18
Prescriber Offices	..	14
Pulman, Geo. & Sons Ltd.	..	18
Putnam's, G. P., Sons Ltd.	..	17
Thacker & Co. (Thacker, Spink & Co.)	..	30
Wright, John & Sons Ltd.	xvii, xxvii, xl, xlviii, l, and 16, 20, 32, 34, 36, 37, 38, 39, 41, 42, 79, 97, 116, 144,	601

SANATORIA FOR TUBERCULOSIS—

Frimley Sanatorium	..	56
Grampian Sanatorium, Kingussie	..	69
Home Sanatorium, West Southbourne	..	69
Leylin-Feydey Sanatoria, Switzerland	..	68
Mendip Hills Sanatorium	..	60
Mervale Sanatorium, nr. Chelmsford	..	xi
Pines Sanatorium, Kelling, near Holt	..	56
Vale of Clwyd Sanatorium, Ruthin	..	xi
Rostrevor Sanatorium, Warrenpoint	..	xi
St. Vincent's Open-Air Hospital and School for Crippled Boys, Pinner	..	69
Vale of Clwyd Sanatorium, Ruthin	..	68
Wensleydale Sanatorium, Aysgarnh	..	68

SANATORIA SHELTERS, TENTS, Etc.—

Black, Thos. & Co., Tents	..	xlvi
Hobson, J. T. & Co.	..	121

SPAS, HEALTH RESORTS, Etc.—

(see "Hydro-Therapeutic Establishments", etc.)

STAMMERING—

Schnelle, A. C.	..	64
-----------------	----	----

STEAMSHIP LINES—

Bibby Line Mail Steamers	..	10
Royal Mail Steam Packet Co.	..	7

SURGEONS' APPOINTMENTS—

Bibby Line Mail Steamers	..	10
--------------------------	----	----

SURGICAL INSTRUMENTS AND APPLIANCES, BANDAGES, Etc.—

Anderson & Whitelaw Ltd.	..	100
Ash, Claudius, Sons & Co. Ltd., Dental Appliances	..	127

SURGICAL INSTRUMENTS, ETC.—continued.

Associated Surgical Appliance Makers Ltd.	100, 110,	116
Bailey, W. H. & Son, Surgical Appliances	..	121
Beatson, Clark & Co. Ltd., Spitting Flasks	..	124
Braid, A. E. & Co. Ltd.	..	xxiv
Brown & Son, Water Still	..	128
Browne & Sayer	..	116, 117
Critchley, J. & Sons, Splints	..	118
Delamotte (A. Plisson, Sucr.)	..	120
Dental Manufacturing Co. Ltd., Dental Appliances	..	126
Domen Belts Co. Ltd.	..	xxii
Down Bros. Ltd.	101, 102,	103
Dowsing Radiant Heat Co. Ltd.	..	74
Drapler & Fils	..	121
Elbard Patents Co., Child's Chamber Seat	..	128
Ernst, F. G., Artificial Limbs, etc.	..	116
Evans, A. E., Orthopaedic Apparatus, etc.	..	110
Gardner, J. & Son	..	118
Grossmith, W. R., Artificial Eyes and Limbs	..	110
Halford, Wm., Artificial Eyes	..	125
Harris, Philip & Co. (1913) Ltd.	..	112
Hawksley & Sons	..	147
Haywood, J. H. Ltd., Appliances	..	120
Hearson, Chas. & Co. Ltd., Incubators	..	125
Holborn Surgical Instrument Co. Ltd.	..	114
Holden Bros., Natureform Boots & Shoes	..	124
Holland & Son, Instep Arch Socks	..	123
Kenney Limb Co. Ltd.	..	113
Marr Stethoscope Syndicate	..	108
Mayer & Phelps	..	109
Medical Supply Association Ltd.	..	102
Millikin & Lawley	..	122
Montague, J. H.	..	98
Pache & Son, Artificial Eyes	..	122
Robinson & Sons Ltd., Gamgee Tissue	..	119
Rudolph (O.C.) & Beesley	..	xvii
Salmon Ody Ltd., Trusses	..	121
Sanborn Co. (London)	..	115
Simmons & Co., Ambulances and Stretchers	..	125
Sumner, R. & Co. Ltd.	..	1
Front End Paper and iv to x	..	xx, xxi
Surgical Manufacturing Co. Ltd.	..	146
Symes & Co. Ltd., Inhaler	..	xv
Theo & Co., Instruments	..	123
Tintometer Ltd.	..	111
Vickers Ltd., Duralumin	..	126
Weiss, John & Son Ltd.	..	1
Young, Archd. & Son	..	1

THERMOMETERS—

Zeal, G. H.	..	xxiv
-------------	----	------

TRANSLATIONS—

Erwin, The Misses	..	12
Ivatts & Young	..	12

TYPEWRITING AND DUPLICATING—

Erwin, The Misses	..	12
Ivatts & Young	..	12

VACCINE LYMPH—

Sumner, R. & Co. Ltd.	..	vii
Young, Archd. & Son, (Dr. Doucet's)	..	66

WIRELESS AND CABLE SERVICES—

North Wales Wireless Schools	..	xvi
------------------------------	----	-----

X-RAY APPARATUS—

British Thomson-Houston Co. Ltd.	..	xi
Cox-Cavendish Electrical Co. Ltd.	xii, xiii	
Dean, A. E. & Co.	..	xiv
Medical Supply Association Ltd.	104, 105	
Mottershead & Co.	..	xvii
Rogers Electric Sales Co. (Great Britain)	107	

Alphabetical Index of Advertisers

	PAGE
Accomb Nursing Home, Maternity ..	xii
Adlard & Son and West Newman Ltd., Publishers ..	xvii
Allen & Hanburys Ltd., Chemists ..	132, 133
Alliance Drug & Chemical Co.	139
Anasarcin Chemical Co.	140
Anderson & Whitelaw Ltd., Surgical Appliances	100
Arnold, Edward, Publisher ..	17, 20
Arrowsmith, J. W. Ltd., Publishers ..	48
Art Reproduction Co. Ltd., Medical Illustrations ..	13
Ash, C. Sons & Co. Ltd., Dental Appliances ..	127
Ashford, near Staines, Inebriate Home ..	71
Ashwood House, Kingswinford, Mental Home ..	90
Associated Surgical Appliance Makers Ltd.	100, 110, 116
Austin Motor Co. Ltd., Cars ..	99
Australian Mutual Provident Society ..	11
Bailbrook House, Bath, Mental ..	93
Bailey, W. H. & Son, Surgical Appliances ..	121
Bailliere, Tindall & Cox ..	17, 19, 20, 21, 45, 47
Dale, J., Sons & Danielsson Ltd., Publishers ..	19, 27
Barnardo's (Dr.) Homes ..	xliii, 602
Barnwood House, Gloucester, Mental ..	91
Bath Spa ..	xliv
Bausch & Lomb Optical Co. Ltd.	iii
Bay View Mount, Paignton, Nursing Home ..	66
Bazzoni Hotel, Lake Como ..	76
Beaton, Clark & Co. Ltd., Spitting Flasks ..	124
Beauworth Manor, Alresford, Nursing Home ..	60
Bethlem Royal Hospital, S.E., Mental ..	80
Pibby Line Mail Steamers ..	10
Black, A. & C. Ltd., Publishers ..	26
Black, Thos. & Co., Tents for Consumptives, etc.	xlviii
Bootham Park, York, Mental Hospital ..	96
Boreatton Park, Baschurch, Mental Home ..	88
Boulton, Miss, Lip-reading ..	64
Braid, A. E. & Co. Ltd., Surgical Appliances ..	xvii
Brand & Co. Ltd., Beef Essence, etc.	xxx1
Branksome Tower Hotel, Bournemouth ..	xlii
Bridge of Allan Mineral Wells ..	74
Bristol <i>Medico-Chirurgical Journal</i> ..	48
Bristol-Myers Co., Chemists ..	xxxii
Britannic Assurance Co. Ltd.	8
British Colloids Ltd., Chemists ..	xxxvi
British Spa Federation ..	xli, xlv, xlvii, xlviii
British Thomson-Houston Co. Ltd., X-Ray Tubes ..	xi
Brompton Hospital for Consumption and Diseases of the Chest ..	56
Brooklands, St. Leonards-on-Sea, Residential School for Blind, etc.	61
Brown & Son, Water Still ..	128
Brown, Gore & Co., Brandies ..	xxviii
Browne & Sayer, Surgical Instruments ..	116, 117
Bruce, Green & Co. Ltd., Opticians ..	116
Brunton House, Lancaster (Feeble Minded) ..	67
Bryce, Wm., Medical Bookseller ..	14
Bryn-y-nedd Hall, Llanfairfechan, Mental ..	85
Buckingham Boarding Establishment, Buxton ..	78
Bucks Mental Hospital, Stone ..	90
Butterworth & Co., Publishers ..	19
Buxton Spa ..	xlv

	PAGE
Callard & Co., Diabetic Foods, etc.	184
Camberwell House, S.E., Mental Home ..	97
Camwal Ltd., 'Aquaperia' Water ..	135
Cassell & Co. Ltd., Publishers ..	28
Caterham Sanitarium and Surrey Hills Hydro ..	78
Centaure Chemical Co. Ltd., Chemists ..	144
Chartered Society of Massage and Medical Gymnastics, London ..	61
Cheltenham Spa ..	xiv
Churchill, J. & A., Publishers ..	21, 25
City Hydropathic and Massage Establish- ment, Birmingham ..	72
City of London Mental Hospital, Dartford ..	87
Clarence Lodge, Clapham Park, S.W., Mental ..	89
Clayton Amine Co. Ltd., Chemists ..	130
Clin Laboratories, Paris (F. H. Mertens) ..	143
Collingwood, Cheltenham Spa, Nursery Home ..	66
Colthurst House School for Epileptic Boys, Warford ..	67
Convalescent Home for Women and Children, New Brighton ..	66
Co-operative Insurance Society Ltd.	10
Co-operative Sanatorium, Bullerley, Epilepsy and Mental ..	67
Copple, The, Nottingham, Mental Hospital ..	84
Cornwall Mental Hospital, Bodmin ..	95
Coton Hill Mental Hospital, Stafford ..	95
Court, The, Bagdon, Nursing Home ..	x1
Cox-Cavendish Electrical Co. Ltd.	xii, xiii
Crailelands Hydro, Ilkley ..	76
Crest Hotel, Crowborough ..	78
Critchley, J. & Sons, Artificial Limbs ..	118
Crookes' Laboratories, Chemists ..	xxxvi
Dalrymple House, Rickmansworth, Inebriate Home ..	71
David Lewis Colony, Warford (Epileptic) ..	67
Dean, A. E. & Co., Radiographic Apparatus ..	xiv
Deighton, Bell & Co. Ltd., Booksellers ..	15
Delamotte (A. Plisson, Sucr.), Surgical Instruments ..	120
Dental Manufacturing Co. Ltd.	126
Domen Belts Co. Ltd.	xxii
Down Bros. Ltd., Surgical Instruments ..	101, 102, 103
Dowsing Radiant Heat Treatment ..	74
Drapier & Fils, Surgical Instruments ..	121
Droitwich Brine Baths Spa ..	xiv
Dublin Journal of Medical Science ..	40
Eagle Star & British Dominions Insurance Co. Ltd.	9
East Sussex County Mental Hospital ..	87
Elbard Patents Co., Child's Chamber Seat ..	128
Elliott, Son & Boyton, Auctioneers, etc.	xvi
Ellis, H. R., Bookseller and Medical Library ..	16
Empire Nursing Home, Westminster, S.W.	65
Ernst, F. G., Artificial Limbs and Appliances ..	116
Erwin, The Misses, Typewriting, etc.	12
Evans, A. E., Orthopædic Apparatus, etc.	110
Evans Sons Lescher & Webb Ltd., Chemists ..	xxxvii
Exeter City Mental Hospital ..	96
Falmouth Hotel, Falmouth ..	79
Fellows Medical Mfg. Co., Inc.	xxxix

	PAGE		PAGE
Ferris & Co. Ltd., Chemists		Lansdown Grove House, Bath, Nursing Home	62
Back End Papers and	139	Laverstock House, Salisbury, Mental	93
Fletcher, Fletcher & Co. Ltd., Endolytic		Lawn, Lincoln, Mental Hospital	96
Tubes for Urine Testing	126	Leamington Spa	xiv
Foyle, W. & G. Ltd., Booksellers	20	Lewis, H. K. & Co. Ltd., Publishers and	
Frimley Sanatorium	56	Medical Library	18, 20, 22, 23
Fry's Cocoa	Front End Paper	Leysin-Feydey Sanatoria, Switzerland	68
Galloway, James, Bookseller	15	Littlebury Bros., Publishers	20
Gardner, J. & Son, Surgical Instruments	118	Livingstone, E. & S., Publishers	35
Gautier Frères' Brandies	xxviii	Llandrindod Wells Spa	xlvii
Genatosan Ltd., Chemists	131	Llangamarch Wells, Lake Hotel	78
General Life Assurance Co.	10	London County Mental Hospital, Claybury	95
Giles, Schacht & Co., Chemists	liv, 605	London Lock Hospitals	53
Glaxo	ii	London & Counties Medical Protection Society	
Graham & Heslip, Publishers	xvi	Ltd.	59
Gramplan Sanatorium, Kingussie	69	Macmillan & Co. Ltd., Publishers	29
Grange, The, Rotherham, Mental Home	89	Male & Female Nurses' Institution, Liverpool	86
Grey House, Sevenoaks, Farm and Garden		Male Nurses' Association, London	63
School for Backward Girls	65	Marr Stethoscope Syndicate, Ear Instruments	108
Grossmith, W. R., Artificial Eyes and Limbs	110	May, Roberts & Co. Ltd., Chemists	xxvii
Guy's Hospital, London	50	Mayer & Phelps, Surgical Instruments	109
Halford, Wm., Artificial Eyes	125	Mayne, Boyd & Son Ltd., Publishers	18
Halliwell, Dr., Torquay, Medical Electricity	79	Medical Defence Union Ltd.	58
Hamond Lodge, Terrington St. Clement,		Medical Officer, The	46
Inebriate Home	71	Medical Press and Circular	45
Hampstead, Glasnevin, and Highfield Drum-		Medical Publishing Co. Ltd.	17
condra, Dublin, Private Asylums	94	Medical Supply Association Ltd., Electro-	
Handford & Dawson, Chemists	144	Medical Apparatus and Surgical Instru-	
Harkness, Beaumont & Co., Chemists	136	ments	104, 105, 106
Harris, Philip & Co. (1913) Ltd., Surgical		Mendip Hills Sanatorium	60
Appliances	112	Menley & James Ltd., Chemists	1
Harrogate Spa	xvii	Merivale Sanatorium, Sandon, near Chelms-	
Hawksley & Sons, Surgical Appliances	147	ford	xli
Haydock Lodge, Newton-le-Willows, Mental		Mertens, F. H., Chemist	143
Hospital	81	Middlesex Hospital Medical School	49
Haywood, J. H. Ltd., Appliances	120	Millfield, York, Mental	92
Hearson, Chas. & Co. Ltd., Bacteriological		Millikin & Lawley, Surgical Instruments	122
Apparatus	125	Montague, J. H., Surgical Instruments	98
Heinemann, Wm. (Medical Books) Ltd.	33	Mottershead & Co., X-ray and Electro-	
Heppell's, Chemists	xxvii	Medical Apparatus	xvii
Hewlett, C. J. & Son Ltd., Chemists	142	Moulton Park, Northampton, Mental Home	83
Hilton & Co., Publishers	16	Nestlé & Anglo-Swiss Condensed Milk Co.	xxx
Hobson, J. T. & Co., Revolving Shelters	124	<i>Neurology and Psychopathology, Journal of</i>	41
Hoffmann-La Roche Chemical Works Ltd.	xxxiv, xxxv	New Lodge, Billericay (Epilepsy and Mental)	67
Holborn Surgical Instrument Co. Ltd.	114	New Mental Nurses' Co-operation, London	64
Holden Bros., Natureform Boots & Shoes	124	New Saughton Hall, Polton, N.B., Mental	84
Holland & Son, Instep Arch Socks	122	New Zealand Spas	xlvii
Holloway Sanatorium, Virginia Water, Men-		Newlands House, Tooting Bec Common,	
tal Hospital	88	S.W.17, Mental Hospital	96
Home Sanatorium, West Southbourne	69	Norfolk Square Nursing Association, London	62
Hospital for Consumption and Diseases of		Normansfield, Hampton Wick (Mentally	
the Chest, Brompton	56	Deficient)	67
Hospital for Sick Children, London, W.C.	52	North Wales Wireless Schools, Carnarvon	xvi
Hospital, The	44	Northumberland House, N., Mental Home	87
Hugoe & Co. Ltd., "Astra" Suet.	xxxiii	Northwoods House, Winterbourne, Mental	90
Hyde Park Nursing Association, W.2	62	Norwood Sanatorium, Beckenham Park	70
Industrial Hygiene, Journal of	29	Nurses' Association, London	63
Ingram & Royle Ltd., Mineral Waters	xxix, 604	Oppenheimer, Son & Co. Ltd. Chemists	xxxix
Ivatts & Young, Typewriting, etc.	12	Otto House, West Kensington, W., Mental	87
James Murray's Royal Asylum, Perth	82	Oxford Medical Publications	18
Kenlaw House, Colinsburgh, Functional		Oxo Ltd., Fluid Beef Extracts	lii
Nervous Disorders	79	Pache & Son, Artificial Eyes	122
Kenley House, Kenley, Surrey	xlvi	Parke, Davis & Co., Chemists	xxvi
Kenney Limb Co. Ltd.	113	Peat Products (Sphagnum) Ltd.	xxxii
Kenworthy's Hydro, Southport	78	Peckham House, Peckham, S.E., Mental	95
Kerol Disinfectants and Antiseptics	ii	Peebles as a Health Resort	72
Kimpton, Henry, Publisher	31	Peebles Hotel Hydro, Peebles	73
Kingsdown House, Box, near Bath, Mental	85	Phillips, Chas. H., Chemical Co.	142
Kolynos Incorporated, Dental Cream	127	Pines Sanatorium, Kelling	56
Laboratories of Pathology and Public Health,		Pleasaunce, York, Mental Home	86
London	58	Plympton House, South Devon, Mental	91
Lake Hotel, Llangamarch Wells	78	Portsmouth Corporation Mental Hospital	94
Lancet, The	43	Prescriber, The	14
		Prince of Wales Hotel, Southport	78

	PAGE		PAGE
Prudential Assurance Co. Ltd. . .	11	Stretton House, Church Stretton, Mental..	85
Pulman, Geo. & Sons Ltd., Publishers . .	18	Sumner, R. & Co. Ltd., Surgical Instruments and Chemists Front and Paper and iv to x	
Putnam's, G. F. Sons' Ltd., Publishers . .	17	<i>Surgery, British Journal of</i>	42
Quibell Brothers Ltd., Disinfectants	ii	Surgical Manufacturing Co. Ltd. . .	xx, xxi
Radium Institute, London	74	Swain, John & Son Ltd., Engravers..	12
Rattray, A. Dewar, Whisky	xxxiii	Swedish Institute and Clinique, London . .	60
Reliance Lubricating Oil Co. Ltd. . .	145	Symes & Co. Ltd., Chemists	146
Retreat, near Armagh, Mental Home . .	86	Tamar Indien Grillon	xxxviii
Retreat, York, Mental Hospital	92	Temple Lodge, Torquay, Inebriate Home . .	71
Reynolds & Branson Ltd., Chemists, and Ledger Cards and Cabinets for Book-keeping	xxiii	Thacker, Spink & Co., (Thacker & Co.), Publishers	30
Rigollet's Mustard Leaves	xxxviii	Theo & Co., Electric Lamps, etc.	xv
Robinson & Sons Ltd., Gamgee Tissue . .	119	Thomson, James B., Treatment for Alcoholic Subjects	70
Rogers Electric Sales Co. (Great Britain), High Frequency Apparatus	107	Three Counties' Mental Hospital, Arlesley . .	91
Rostrevor Sanatorium, Warrepoint . . .	xl	Throxenby Hall, near Scarborough, Mental	92
Royal Albert Institution, Lancaster (Feeble Minded Children)	67	Tidswell, Ernest, M.A., F.F.I., Life Assurance Consultant	6
Royal College of Surgeons, Edinburgh . .	57	Tintometer Ltd., Diagnostic Apparatus . .	123
Royal Dental Hospital, London	53	Three Island, West Highlands, Boarding Facilities for Alcoholic Subjects	70
Royal Eye Hospital, S.E.1	56	Tremezzo, Lake Como, Hotel Bazzoni . .	76
Royal Hotel, Southport	78	<i>Tuberculosis, British Journal of</i>	47
Royal Mail Steam Packet Co.	7	Tue Brook Villa, Liverpool	92
Rudolph (O. C.) & Beesley, Microscopes and Instruments	xvii	University of Aberdeen	57
Salamon & Co. Ltd., Chemists	146	— — Bristol	54
Salmon Ody Ltd., Trusses	121	— — Durham	55
Sanagon Co. Ltd., Nerve Food, etc., Sanborn Co. (London), Instruments . .	115	— — Liverpool	57
Sapon Soaps Ltd.	xxxviii	Uplands, Macclesfield, Mental	96
Schnelle, A. C. (Stammering)	64	Vale of Clwyd Sanatorium, Ruthin..	68
Shadforth, Wm., Chemist	144	Valentine's Meat-Juice Co.	xlix
Shaffesbury House, Formby-by-Sea, Mental	82	Vichy-Océstins (Waters)	xxxix, 604
Silver Birches, Epsom, Mental Home . .	92	Vickers Ltd., Duralumin	111
Simmons, D. H., Motor Car Agent . . .	xxviii	Warneford, The, Oxford, Mental Hospital..	89
Simmons & Co., Ambulances and Stretchers	125	Weiss, John & Son Ltd., Surgical Instruments	126
Singer & Co. Ltd., Motor Cars	xix	Wensleydale Sanatorium, Aysgarth..	68
Sir William Crookes' Anti-Glare Glass Co. Ltd., Opticians	123	Wesleyan and General Assurance Society . .	8
Slieve Donard Hotel, Newcastle, Co. Down	77	West Sussex County Mental Hospital . .	94
Smedley Hydro, Southport	72	Westminster Hospital Medical School . .	53
Smedley's Hydro, Matlock	75	Whiffen & Sons Ltd., Chemists	140
Southall Bros. & Barclay Ltd., Chemists .	137	Willows, Francis, Butler & Thompson Ltd., Chemists	145
S. P. Charges Co., Sulphaqua	146	Woodhall Spa	xlvii
Spiller, George, Ltd., Opticians	xxv, 603	Woolley, James, Sons & Co. Ltd., Chemists	136
Springfield House, near Bedford, Mental Home	93	Worcestershire Brine Baths Hotel, Droitwich	70
St. Andrew's Hospital, Northampton, Mental	83	Wright, John & Sons Ltd., Publishers xvii, xxvii, xl, xlviii, 1, and 16, 20, 32, 34, 36, 37, 38, 39, 41, 42, 79, 97, 116, 144,	601
St. George's Retreat, Burgess Hill, Mental..	94	Wye House Asylum, Buxton..	96
St. John's Skin Hospital, London	52	Wyleys Ltd., Chemists	138
St. Luke's Hospital, London, Mental Nurses	61	Ye Wells Hotel, Llandrindod Wells	79
St. Patrick's Mental Hospital, Dublin . .	80	Yorkshire Insurance Co. Ltd.	2
St. Paul's House, St. Leonards-on-Sea, School and Home for backward girls	66	Young, Archd. & Son, Instruments and Vaccine Lymph	1, 606
St. Thomas's Hospital Medical School . .	51	Zeal, G. H., Thermometers	xxiv
St. Vincent's Open-Air Hospital and School for Crippled Boys, Pinner	69	Zimmermann, Chas. & Co. (Chemicals) Ltd.	141
Standard Motor Co. Ltd., Cars	98		
Stoke Park Colony, Stapleton, Bristol (Mentally Defective Children)	65		
Struthpeffer Spa	76		

Index to Books

Advertised in the Present Volume.

	PAGE		PAGE
Abdominal Surgery (CURTIS) <i>Med. Pub. Co.</i>	17	Deformities (TUBBY)	Macmillan 29
Air Sickness (CRU'CHET & MOULINIER) <i>Bale</i>	27	Dementia Præcox (BARCLAY & ROBERTSON)	Livingstone 35
Anæsthetics (BUXTON)	Levis 22	Dentistry, Synopsis of (UNDERWOOD)	Churchill 25
Anæsthetics (ROSS)	Livingstone 35	Diagnosis of Main Symptoms, Index of	
Anatomy, Guide to (EWART)	Levis 23	Differential (FRENCH)	Wright 36
Anatomy, Human, Fundamentals of		Diagnosis, Surgical (GOULD)	Cassell 28
(PITZMAN)	Kimpton 31	Diathermy (CUMBERBATCH)	Heinemann 33
Anatomy, Medical Applied (JOHNSON) <i>Black</i>	26	Diathermy in Medical and Surgical Practice	
Anatomy of the Human Skeleton (FRAZER)		(SABERTON)	Cassell 28
Churchill	25	Dispensing Labels	Wright 29
Anatomy Principles as seen in the Hand		Doctor's Manual or Practitioner's Vade	
(JONES)	Churchill 24	Mecum (HART)	Bale 27
Anatomy, Surgical (WHITTAKER) <i>Livingstone</i>	35	Ear, Diseases of, in School Children (LOVE)	Wright 38
Anatomy, Surgical Applied		Edinburgh School of Surgery before Lister	
(TREYES, KEITH, & MACKENZIE) <i>Cassell</i>	28	(MILES)	Black 26
Anxiety Hysteria (RIXON & MATTHEW)		Electric Ionization (FRIEL)	Wright 31
Levis	23	Electrical Treatment (HARRIS)	Cassell 28
Appendicitis (ECCLES)	Bale 19	Electricity, Medical (LEWIS JONES)	Levis 22
Arteries, Diseases of, and Angina Pectoris		Electro-Diagnosis and Therapeutics, Atlas of	
(ALLBUTT)	Macmillan 29	(LAROQUETTE)	Bailliere 21
Atlas of Head, Neck, and Trunk		Electrotherapy (WEBB)	Churchill 24
(SYMINGTON)	Mayne, Boyd 18	Eye, Diseases and Injuries of (SYM) <i>Black</i>	26
Bacteriology, Bloodwork, and Animal Parasitology (STUTT)	Levis 23	Eye, Swanzy's Handbook (WERNER) <i>Levis</i>	23
Bacteriology and Hæmatology, Clinical		Fibroids and Allied Tumours (LOCKYER)	Macmillan 29
(EMERY)	Levis 22	'First Aid' to the Injured and Sick	
Bandaging and Surgical Dressing (Pye's)		(WARWICK & TUNSTALL)	Wright 1
(COPE)	Wright 1	'First Aid' Wall Diagrams	
Blood Pictures (PRICE-JONES)	Wright 34	(WARWICK & TUNSTALL)	Wright 1
Blood-Vessels, Gunshot Injuries to (MAKINS)		Fowl, Structure of (BRADLEY)	Black 26
Wright	32	Fractures, Modern Methods of Treating	
Brain and Spinal Cord, Anatomy of		(GROVES)	Wright 32
(WHITTAKER)	Livingstone 35	Fractures, Operative Treatment of (LANE)	Adlard xvii
Cardiac Examination (COMRIE)	Bale 27	Galvanism and Paralysis (MAGILL) <i>Levis</i>	23
Cataract, Couching for (ELLIOTT)	Levis 18	Genito-Urinary Diseases and Syphilis (MORTON)	Kimpton 31
Catechism Series in Medicine and Surgery		Glaucoma (ELLIOT)	Levis 18
Livingstone	26	Gonococcal Infection in the Male (LUMB) <i>Bale</i>	27
Cerebrospinal Fever (WORSTER-DROUGHT & KENNEDY)	Black 26	Gout (LEWELLIN)	Heinemann 33
Certificate Books	Wright 20	Greek Medicine in Rome (ALLBUTT)	Macmillan 29
Charts and Chart Holders	Wright 20	Gummata (CURTIS)	Med. Pub. Co. 17
Chemistry, Manual of (LUFF & CANDY)		Gynæcological Surgery (BERKELY & BONNEY)	Cassell 28
Cassell	28	Gynæcology (EDEN & LOCKYER) <i>Churchill</i>	24
Chest and Abdomen, Physical Signs in		Gynæcology, New System of	
(JEX-BLAKE)	Churchill 24	(EDEN & LOCKYER)	Macmillan 29
Children, Diseases of (BURNETT) <i>Livingstone</i>	35	Gynæcology, Operative (CROSSEN) <i>Kimpton</i>	31
Children, Diseases of (DINGWALL-FORDYCE)		Gynæcology, Student's Handbook (HEIMAN & MAXWELL)	Cassell 28
Black	26	Health of the Industrial Worker (COLLIS & GREENWOOD)	Churchill 24
Children, Diseases of (GOODHART & STILL)		Health, Laws of, for Schools (MALCOLMSON)	Black 26
Churchill	24	Hernia (ECCLES)	Bailliere 19
Children in India (BIRCH)	Thacker 30	Hygiene, Synopsis of (JAMESON & MARCHANT)	Churchill 25
Cleft-Palate and Hare Lip (LANE) <i>Adlard</i>	xvii	Hygiene and Public Health (GHOSH) <i>Hulton</i>	16
Clinical Guide, Pocket (BURNETT)	Black 26	Hygiene and Public Health (PARKES & KENWOOD)	Levis 22
Clinical Methods (HUTCHISON & RAINY)			
Cassell	28		
Clinical Methods for Indian Students (BIRDWOOD)	Thacker 30		
Collectors' Books and Cards	Wright 20		
Colon, Diseases of the (MUMFERY) <i>Bailliere</i>	19		
Consumption: Treatment at Home and Rules for Living (CROWE)	Wright xlviii		
Cranial Surgery (CURTIS) <i>Med. Pub. Co.</i>	17		
Deafness, Giddiness, and Noises in the Head (WOLKES)	Levis 20		

	PAGE		PAGE
Hygiene and Public Health (WHITELEGGE & NEWMAN)	Cassell 28	Ophthalmic Operations (GRIMSDALE & BREWERTON)	Bailliere 21
Hypnotic Suggestion (TAPLIN)	Littlebury 20	Ophthalmic Operations (MAYNARD)	Livingstone 35
Industrial Clinic (COLLIS)	Bale 27	Ophthalmic Practice (MAYNARD)	Livingstone 35
Labour, Difficult (HERMAN)	Cassell 28	Ophthalmology (BALLANTYNE)	Livingstone 35
Labour, Normal, Atlas of (ROBINSON)	Heinemann 33	Oto-Rhino-Laryngology (LAUBENS)	Wright 38
Landmarks and Surface Markings of the Human Body (RAWLING)	Lewis 23	Paralyses, Surgery of (TUBBY & JONES)	Macmillan 29
Lectures and Essays, Selected (BLAND-SUTTON)	Heinemann 33	Parenthood, Control of (STOPES)	Putnam's 17
Ligations and Amputations (BROCA)	Wright 33	Parenthood, Wise (STOPES)	Putnam's 17
Liver Abscesses (CURTIS)	Med. Pub. Co 17	Pasteur and after Pasteur (PAGET)	Black 26
Lunacy in India (OVERBECK-WRIGHT)	Bailliere 21	Pathology, General and Special (BEATTIE & DICKSON)	Heinemann 33
Lungs and Pleura (POWELL & HARTLEY)	Lewis 23	Pathology, Morbid Anatomy, and Post-mortem Technique (MILLER)	Black 26
Malaria at Home and Abroad (JAMES)	Bale 27	Pathology, Surgical (BOWLEY & ANDREWS)	Churchill 25
Malaria, Studies in (STOTT)	Thacker 30	Pathology, Text-book of (DELAFIELD & PRUDEN)	Bale 27
Manic-depressive Insanity and Paranoia (BARCLAY & ROBERTSON)	Livingstone 35	Peripheral Nerves, Injuries of the (SOUTAR & TWYNING)	Wright 39
Marine Hygiene and Sanitation (BROOKE)	Bailliere 21	Pharmacology, Synopsis of (COW)	Churchill 25
Married Love (STOPES)	Putnam's 17	Pharmacopoeia, The Extra (MARTINDALE & WESTOFT)	Lewis 23
Massage (MEXNELL)	Churchill 24	Physical Fitness, Assessment of (DREYER & HANSON)	Cassell 28
Massage and Electricity (DOWSE)	Wright 79	Physics, Manual of (CANDY)	Cassell 28
Massage and Medical Gymnastics (KLEEN)	Churchill 24	Physiology, Human (LUCIAN)	Macmillan 29
Massage, Theory and Practice of (GOODALL-COPESTAKE)	Lewis 23	Physiology, Principles of (STARLING)	Churchill 24
Materia Medica (BRUCE & DILLING)	Cassell 28	Physiology, Synopsis of (ROBERTS)	Churchill 25
Materia Medica (GHOSH)	Hilton 16	Physiology, The New (SHORT)	Wright 34
Materia Medica, Pharmacy, Pharmacology and Therapeutics (HALE-WHITE)	Churchill 23	Physiology and Biochemistry in Modern Medicine (MACLEOD)	Kimpton 31
Medical Account Books	Wright 20	Prescriber, Pocket (BURDET)	Black 26
Medical Jurisprudence (TAYLOR)	Churchill 25	Prescribing of Spectacles (PERCIVAL)	Wright 116
Medical Jurisprudence for India (LYONS)	Thacker 30	Prescription Books	Wright 20, 144
Medical Jurisprudence and Toxicology (GLAISTER)	Livingstone 35	Prognosis, Index of, and End-Results of Treatment (SHORT)	Wright 37
Medical Jurisprudence and Toxicology (ROBERTSON)	Black 26	Psychopathology (KEMPFF)	Kimpton 31
Medical Treatment (YEO)	Cassell 28	Public Health Chemistry and Bacteriology (MCKAIL)	Wright 97
Medicine, Handbook of (JACK)	Livingstone 35	Public Health Laboratory Work (KENWOOD)	Lewis 23
Medicine, Medial (WALSH)	Black 26	Public Health, Manual of (ROBERTSON)	Black 26
Medicine, Practical (CARTER)	Lewis 23	Public Health, Text-book of (GLAISTER)	Livingstone 35
Medicine, Preventive (HEWLETT & NANKIVELL)	Churchill 21	Pulmonary Tuberculosis (BURTON-FANNING)	Cassell 28
Medicine, Synopsis of (TIDY)	Wright 39	Pulmonary Tuberculosis in General Practice (SUTHERLAND)	Cassell 28
Medicines, Practical Bazaar (BIRDWOOD)	Thacker 30	Radiography and Radiotherapeutics (KNOW)	Black 26
Midwifery, Handbook of (BERKELEY)	Cassell 28	Radiology, Textbook of (MORTON)	Kimpton 31
Midwifery, Short Practice of (JERLETT)	Churchill 24	Radiumtherapy (WICKHAM & DEGRAIS)	Cassell 28
Midwifery, Synopsis of (BOURNE)	Wright 39	Rectum and Anus (MUMMERY)	Bailliere 19
Midwifery, Text-book of (JOHNSTONE)	Black 26	Sclero-Corneal Trephining in Glaucoma (ELLIOT)	Pulman 18
Military Psychiatry (BRAN)	Lewis 23	Serums, Vaccines, and Toxins (DOSANQUET & BYRE)	Cassell 28
Military Sanitation (BLACKMAN)	Bale 27	Sex Complex (BELL)	Bailliere 21
Mind and its Disorders (STODDART)	Lewis 23	Sigmoidoscope (MUMMERY)	Bailliere 19
Motherhood, Radiant (STOPES)	Putnam's 17	Skin Diseases (GARDINER)	Livingstone 35
Muscles, Action of (JACKENZIE)	Lewis 23	Skin Diseases (MACLEOD)	Lewis 23
Nervous Diseases, Diagnosis of (STEWART)	Arnold 20	Skin Diseases (MORRIS)	Cassell 28
Nervous Diseases, Text-book of (DANA)	Wright 97	Skin Diseases (SIBLEY)	Arnold 17
Neurasthenia, Manual of (CORI)	Bailliere 21	Skin Diseases (SUTTON)	Kimpton 31
Nose and Throat (THOMSON)	Cassell 22	Smallpox, Diagnosis of (RICKETTS & BYLES)	Cassell 28
Nose and Throat (TILLEY)	Lewis 22	Smallpox and Vaccination, Half-a-Century of (M'VAIL)	Livingstone 35
Nose, Throat and Ear (SKENE)	Livingstone 35	Spine, Lateral Curvature of, and Flat Foot (SMITH)	Wright 16
Obstetrics and Gynaecology (CAMPBELL)	Mayne, Boyd 18	Surgery at a Casualty Clearing Station (WALLACE & FRASER)	Black 26
Obstetrics, Difficult (BERKELEY & BONNEY)	Churchill 25		
Open-Air at Home (BATES)	Wright 31		

	PAGE		PAGE
Surgery in Britain, Early History of (PARKER)	26	Tropical Hygiene (LUXIS & BLACKHAM)	30
<i>Black</i>		<i>Thacker</i>	
Surgery, Clinical, by Case Histories	31	Tropical Medicine, Essentials of (MASTERS)	27
(HERTZLER) <i>Kimpton</i>		<i>Bale</i>	
Surgery, Synopsis of (BACK & EDWARDS)	23	Tropical Medicine and Hygiene (DANIELS)	27
<i>Churchill</i>		<i>Bale</i>	
Surgery, Synopsis of (GROVES)	39	Tropical Medicine, Laboratory Studies in	27
(DANIELS & NEWMAN) <i>Dale</i>		(DANIELS & NEWMAN) <i>Dale</i>	
Surgery, Text-book by Various Authors	23	Tropical Ophthalmology (ELLIOT)	18
(GASK & WILSON) <i>Churchill</i>		<i>Oxford Med. Publications</i>	
Surgical Handicraft, Pye's (CLAYTON-GREENE)	32	Tuberculin in the Treatment of Pulmonary	xvi
<i>Wright</i>		Tuberculosis, Rational Method of Using	
Surgical Nursing, Lectures on (BISHOP)	xxvii	(GILLESPIE) <i>Graham & Heslop</i>	
<i>Wright</i>		Tuberculosis of Bones and Joints in Children	26
Surgical Operations, Student's Handbook	28	(FRASER) <i>Black</i>	
(TREVES & HUTCHINSON) <i>Cassell</i>		Tuberculosis, Treatment of (LAIRD) <i>Wright</i>	xi
Surgical Patients, The After-treatment of	31	Tumours, Innocent and Malignant (BLAND-	28
(BARTLETT) <i>Kimpton</i>		SUTTON) <i>Cassell</i>	
Symptoms in the Diagnosis of Disease	31	Twilight Sleep (WEBB-JOHNSON) <i>Butterworth</i>	19
(HARE) <i>Kimpton</i>			
Syphilis and Venereal Diseases (MARSHALL &	20, 21	Urology, Text-book of (PEDERSEN) <i>Kimpton</i>	31
PFRENCH) <i>Bailliere</i>			
Syphilis, Intensive Treatment of (HAYES)	17	Venereal Disease (REID) <i>Heinemann</i>	33
<i>Bailliere</i>		Venereal Diseases (MCDONAGH) <i>Heinemann</i>	33
Syphilis in the Male, Lesions of Acquired	27		
(WHITE & BROWN) <i>Dale</i>		Water Supplies, Rural (HOUSTON) <i>Bale</i>	27
		Water Supply, Rivers as Sources of (HOUSTON)	27
Testis, The Imperfectly Descended (ECLFES)	19	<i>Bale</i>	
<i>Bailliere</i>		Wives and Mothers in India and the Tropics	80
Throat, Nose, and Ear (MCKENZIE)	33	(STALEY) <i>Thacker</i>	
<i>Heinemann</i>			
Throat, Nose, and Ear (PORTER) <i>Wright</i>	38	X-Rays, General Practice and (KNOX)	26
		<i>Black</i>	
Treatment, An Index of	37	Zoology for Medical Students (KERR)	29
(HUTCHISON & SHERREN) <i>Wright</i>		<i>Macmillan</i>	
Tropical Diseases (MANSON) <i>Cassell</i>	23		
Tropical Diseases (STITT) <i>Lewis</i>	23		

PERIODICALS.

	PAGE
Bristol Medico-Chirurgical Journal	48
British Journal of Surgery	42
British Journal of Tuberculosis	47
Dublin Journal of Medical Science	40
Hospital, The	44
Indian Medical Gazette	30
Industrial Hygiene, Journal of	29
Lancet, The	43
Medical Officer, The	46
Medical Press and Circular	45
Neurology and Psychopathology, Journal of	41
Prescriber, The	14

WANTED

Back Volumes of the

"Medical Annual," 1918.

also

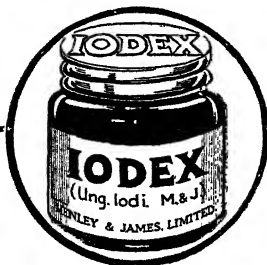
Back Numbers of the

"British Journal of Surgery"

Volume I, No. 2; Volume II, No. 7;

Volume IV, No. 16; Volume V, Nos. 17, 19, and 20.

JOHN WRIGHT AND SONS LTD., BRISTOL.



Iodex is iodine idealised

Rheumatism,

Goitre,

Synovitis,

Pleurisy,

Neuritis,

Stiff

Joints.



SUPPOSI-

TORY

Hæmorrhoids

Fistula,

Pruritis Ani,

Rectal Ulcers,

**Rectal
Neuralgia,**

Fissures.

There is no virtue in Iodine which is not found in Iodex, but there is no vice in Iodex, despite the inherent vices of Iodine. In other words, Iodex is Iodine idealised—Iodine par excellence for external use.

Iodex presents 5% of therapeutically free iodine in ointment form. It does not stain the skin, does not irritate, and is remarkable for its rapid and complete absorption. Antiseptic, inflammation-reducing, bland, Iodex is of marked value in the following conditions:—Rheumatism, stiff and swollen joints, enlarged glands, parasitic skin diseases, and inflamed conditions generally. The field of its successful application is ever widening, and its use by the profession is now universal.

The attempts to employ Iodine in abnormal rectal and vaginal conditions have hitherto been frustrated by its characteristic disadvantages and drawbacks. Apart from the irritating action of this otherwise extremely valuable drug, its solvents—the alcohol of the tincture and the potassium iodide of the ointment—are in themselves irritating, when applied to mucous surfaces. The introduction of Iodex in suppository and pessary form permits the use of therapeutically free Iodine for rectal and vaginal treatment whenever Iodine is indicated.

Parasitic

Skin

Diseases,

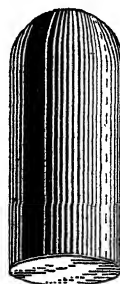
Chilblains,

Burns,

Inflamed

Conditions

Generally.



PESSARY.

Vaginitis,

Gonorrhœa,

Leucorrhœa,

Cervicitis,

Ovaritis.

MENLEY & JAMES, LTD. Manufacturing Chemists,
64 HATTON GARDEN, LONDON.

The Medical Defence Union AND INDEMNITY ASSURANCE

THE premium in respect of SPECIAL ARRANGEMENT with the Medical Defence Union under which THE YORKSHIRE INSURANCE CO. LTD., undertook to indemnify Members of the Union against pecuniary loss in regard to Costs and Damages through adverse verdicts in actions brought against them and taken up by the Council, is now included in the subscription to the Union, but the amount of the Indemnity—which remains at £2,500 in any one action—is still guaranteed by the “YORKSHIRE.”

Full information may be obtained from the MEDICAL DEFENCE UNION,
4 Trafalgar Square, London, W.C.

THE YORKSHIRE INSURANCE CO. LTD. (Estab. 1824.)

Assets exceed EIGHT MILLIONS.

Chief { St. Helen's Square, York.
Offices : { Bank Buildings, Princes St., London, E.C.2

The Company transacts the following classes of business on
the most favourable terms :

FIRE. LIFE. ANNUITY. CASUALTY. TRUSTEE & EXECUTOR.
MOTOR CAR. LOSS OF PROFITS FOLLOWING FIRE.
EMPLOYERS' LIABILITY (Including Domestic Servants). BURGLARY.
PERSONAL ACCIDENT. SICKNESS. FIDELITY. MARINE.
THIRD PARTY. PLATE GLASS. LIVE STOCK, Etc.

INDEX TO LIFE ASSURANCE OFFICES.

A, when Established; B, C, D, Annual Premiums to Insure £100 on death, with Profits, at the age of 30, 40, and 50; E, Assurance and Annuity Funds, exclusive of Paid-up Capital; M, Mutual Offices; P, Proprietary Offices.

Those marked with an asterisk (*) in the E column have not returned our last form, but we give their latest revised figures.

TITLE, ETC., OF OFFICE.	A	B	C	D	E
Abstainers and General Insurance Co., Ltd., Edmund St., Birmingham. <i>Gen. Manager,</i> H. J. Greening P	1883	40/11	55/10	82/3	£ 1,221,612
Alhance Assurance Co. Ltd., Bartholomew Lane, E.C. <i>Gen. Man.</i> , O. Morgan Owen P	1824	48/9	64/5	90/9	17,978,033
Atlas Assurance Co. Ltd., 92, Cheapside, E.C. <i>Gen. Man.</i> C. H. Falloon. <i>Act.</i> , William Penman P	1808	49/3	63/7	88/8	2,677,837
Australian Mutual Provident Society, Life, Endowments and Annuities, 37, Thredneedle Street, E.C. <i>Manager for</i> U.K., W. C. Fisher. Further particulars see page 11 M	1849	48/2	64/5	89/10	39,198,425
Britannic Assurance Co. Ltd., Life, En- dowment Assurances, House Purchase, Broad Street Corner, Birmingham. <i>Chair-</i> <i>man</i> , J. A. Patrick, J.P. <i>Secretary</i> , J. M. Laing, F.I.A. Further particulars see page 8 P	1866	47/9	64/-	91/1	5,293,551
British Equitable Assurance Co. Ltd., 1, 2, 3, Queen Street Place, E.C. <i>Manager</i> , Basil May, F.I.A. P	1854	48/8	64/11	91/9	1,550,856
Caledonian Insurance Co., 19, George Street, Edinburgh. <i>Gen. Man.</i> , R. Hill Stewart, F.F.A. London Offices, 82, King William St., E.C., and 14, Waterloo Place, S.W. P	1805	48/9	64/6	88/6	3,889,147
Canada Life Assurance Co., 15, King Street, Cheapside, E.C. <i>Man.</i> , J. R. Wandless. F.I.A. P	1847	48/5	65/4	94/2	13,649,519
City Life Assurance Co. Ltd., 6, Paul Street, Finsbury, E.C. <i>Gen. Man.</i> , D. Bailey, F.S.S. Clerical, Medical, and General Life Assurance Society, 15, St. James's Square, S.W., and 1, King William Street, E.C. <i>Gen. Man. &</i> <i>Act.</i> , A. D. Besant P	1897	44/1	60/11	89/7	*1,066,021
Colonial Mutual Life Assurance Society Ltd., 33, Poultry, E.C. <i>Man.</i> , Arthur E. Gibbs. <i>Assist. Man.</i> , Ernest A. Cawdron M	1824	50/11	69/2	99/8	6,439,750
Commercial Union Assurance Co. Ltd., 24, 25, and 26, Cornhill, E.C. <i>Act.</i> , A. G. Allen P	1873	48/9	65/1	89/10	*5,600,000
Co-operative Insurance Society Ltd., 109, Corporation Street, Manchester. <i>Man.</i> , J. P. Jones. Further particulars see page 10 P	1861	47/10	65/2	92/4	7,946,810
Eagle Star & British Dominions Insurance Co., Ltd. Head Office, British Dominions House, Royal Exchange Avenue, E.C. 3; Life Dept., 32, Moorgate St., E.C. 2 <i>Man.</i> <i>Dir.</i> , Sir Edward M. Mountain P	1867	47/4	63/1	90/1	1,073,161
Further particulars see page 9 P	1807	49/9	66/3	93/8	13,005,125
Equitable Life Assurance Society, Mansion House Street, E.C.2. <i>Act. & Man.</i> , W. Palin Elderton, F.I.A. M	1762	54/-	63/-	92/-	4,897,380
Equity and Law Life Assurance Society, 18, Lincoln's Inn Fields, W.C. <i>Man. & Sec.</i> , W. P. Phelps, M.A., F.I.A. P	1844	48/10	64/6	90/9	5,153,999
Friends' Provident & Century Life Office, 42, Kingsway, W.C.2. and 18 Charlotte Square, Edinburgh. <i>Gen. Man.</i> , Henry J. Tapscott. <i>Act.</i> , Alfred Moorhouse, F.I.A. M	1832	48/-	64/3	89/9	3,451,309

A, when Established; B, C, D, Annual Premiums to Insure £100 on death, with Profits, at the age of 30, 40, and 50; E, Assurance and Annuity Funds, exclusive of Paid-up Capital; M, Mutual Offices; P, Proprietary Offices.

Those marked with an asterisk (*) in the E column have not returned our last form, but we give their latest revised figures.

†The Legal and General Assurance are not for the present issuing Policies under with Profit tables.

TITLE, ETC., OF OFFICE.	A	B	C	D	E
General Accident Fire and Life Assurance Corporation Ltd., Perth, Scotland. <i>Gen. Man.</i> , F. Norie-Miller, J.P. P	1885	49/2	64/11	91/3	303,252
General Life Assurance Co. , 103, Cannon Street, E.C. 4. <i>Sec.</i> , Albert Burton Nye. Further particulars see page 10 P	1837	49/10	65/4	92/8	1,932,366
Gresham Life Assurance Society Ltd., St. Mildred's House, Poultry, E.C. 2. <i>Gen. Man. & Sec.</i> , Alexander Lawson P	1848	47/6	62/10	88/6	9,907,800
Guardian Assurance Co. Ltd., 11, Lombard Street, and 21 Fleet St., E.C. <i>Gen. Man.</i> , Geo. W. Reynolds. <i>Act.</i> , Ernest Woods P	1821	48/10	61/6	89/3	4,381,890
Law Union and Rock Insurance Co. Ltd., 7, Chancery Lane, W.C. <i>Sec.</i> , J. Stirling P	1805	48/4	64/-	89/10	8,469,686
Legal & General Assurance Society, Ltd., 10, Fleet St., E.C. <i>Act. & Man.</i> , E. Colquhoun P	1836	36/-	50/-	74/4	12,751,101
Life Association of Scotland, 82, Princes St., Edinburgh. <i>Man.</i> , Gordon Douglas. <i>Sec.</i> , R. M. M. Roddick. London Office, 28, Bishopsgate, E.C. <i>Sec.</i> , G. S. N. Carter, F.I.A. Liverpool and London and Globe Insurance Co. Ltd., 1, Dale Street, Liverpool. <i>Gen. Man. & Sec.</i> , Hugh Lewis. London Office, 1, Cornhill, E.C. P	1838	48/11	64/10	91/1	5,833,442
London and Scottish Assurance Corporation Ltd., 66, 67, Cornhill, E.C. <i>Gen. Man.</i> , W. Ainslie Mackay. <i>Sec.</i> , Louis I. Jarvis. <i>Int. Asst. Sec.</i> , E. B. Dent and L. C. Kestn. <i>Act.</i> , Harold Dougharty P	1836	49/10	65/9	91/3	4,974,054
London Assurance Corporation, 7, Royal Exchange, E.C. <i>Man.</i> of Life Dept., James Chines. <i>Act.</i> , A. G. Hemming P	1862	48/9	64/9	91/2	*4,102,636
London Life Association, Ltd., 81, King William Street, E.C. <i>Act. & Man.</i> , H. M. Truencer, M.A., F.I.A. M	1720	49/-	64/8	90/2	2,998,542
Marine and General Mutual Life Assurance Society, 14, Leadenhall Street, E.C. <i>Act. & Sec.</i> , S. Day, F.I.A. M	1806	47/-	61/8	85/4	6,040,299
Medical Sickness Annuity & Life Assurance Society, Ltd., 300, High Holborn, W.C. <i>Man. & Sec.</i> , Bertram Sutton, F.C.I.I. M	1852	48/10	65/-	91/6	2,153,393
Metropolitan Life Assurance Society, 13, Moor-gate Street, E.C. 2. <i>Act. & Man.</i> , H. J. Baker, F.I.A. M	1884	40/2	55/3	80/-	330,000
Mutual Life and Citizens' Assurance Co. Ltd. (of Australia), Effingham Ho., 1, Arundel St. W.C. <i>Man.</i> , Alex. S. Sellar, M.A., F.F.A. P	1835	49/9	66/4	92/-	2,300,015
Mutual Life Insurance Co. of New York, 7 & 8, Norfolk Street, Strand, W.C. 2. <i>Gen. Man.</i> , J. H. Harrison Hogge. <i>Sec.</i> , L. A. Mumford M	1856	48/9	65/3	89/9	11,410,325
National Benefit Assurance Co. Ltd., National House, Newgate Street, E.C. <i>Man.</i> , J. Francis, O.B.E., J.P. <i>Sec.</i> , C. G. Talbot. P	1843	48/9	66/	97/-	133,140,791
National Mutual Life Assurance Society, 39, King Street, Cheapside, E.C. <i>Act. & Man.</i> , G. Marks, C.B.E., F.I.A. <i>Asst. Act.</i> , H. G. Sharp, F.I.A. <i>Sec.</i> , G. V. S. Booth. M	1890	46/4	61/7	87/4	70,179
National Mutual Life Association of Australasia, Ltd., 5, Cheapside, E.C. <i>Man.</i> , H. W. Meyers. M	1830	48/4	63/7	89/6	3,084,686
National Provident Institution, 48, Gracechurch Street, E.C. <i>Act. & Sec.</i> , L. F. Nevill, F.I.A. M	1869	46/3	61/6	87/2	12,524,368
New York Life Insurance Co., Trafalgar Buildings, Trafalgar Square, London, W.C. <i>Gen. Man.</i> , F. H. Krauss. <i>Sec.</i> , Wm. R. Collinson, F.C.I.S. M	1835	50/2	66/3	91/1	7,401,182
	1845	18/9	66/-	96/11	204,476,992

A, when Established; B, C, D, Annual Premiums to Insure £100 on death, with Profits, at the age of 30, 40, and 50; E, Assurance and Annuity Funds, exclusive of Paid-up Capital; M, Mutual Offices; P, Proprietary Offices.

Those marked with an asterisk (*) in the E column have not returned our last form, but we give their latest revised figures.

TITLE, ETC., OF OFFICE.	A	B	C	D	E
North British and Mercantile Insurance Co. Ltd. 61, Threadneedle St., E.C. 2, & 64, Princes St., Edinburgh. <i>Gen. Man.</i> , London, A. Worley. <i>Gen. Man.</i> , Edin., Owen D. Jones	1809	49/10	66/1	91/11	18,663,072
Northern Assurance Co. Ltd, 1, Moorgate Street, E.C. 4. <i>Joint Gen. Managers</i> , H. Gayford, J. Robertson P	1836	49/-	64/8	90/10	5,140,651
Norwich Union Life Insurance Society, Norwich. <i>Gen. Man. & Act.</i> , Davidson Walker. London Office, 49, Fleet Street, E.C. 4. M	1808	45/8	59/6	85/3	17,100,635
Pearl Assurance Co. Ltd., 252, High Holborn, W.C. 1. <i>Man'g Director</i> , G. Shruballs, J.P. P	1864	49/-	65/-	92/-	15,340,948
Phoenix Assurance Co. Ltd., Phoenix House, King William St., E.C. 4, Trafalgar House, Waterloo Place, S.W. 1, & 187, Fleet Street, E.C. 4. <i>Gen. Man.</i> , R. Y. Sketch. P	1782	48/11	64/7	90/8	11,658,054
Provident Mutual Life Assurance Association, 27 & 29, Moorgate Street, E.C. 4. <i>Man. & Act.</i> , C. R. V. Coutts M	1840	51/-	68/-	91/-	3,000,000
Prudential Assurance Co. Ltd, Holborn Bars. <i>Sec.</i> , Sir George May, K.B.E. Further particulars see page 11 P	1848	49/6	65/11	91/11	55,627,925
Refuge Assurance Co. Ltd., Oxford Street, Manchester. <i>Gen. Mans.</i> , J. Proctor Green and W. H. Aldcroft. London Office, 131, Strand, W.C. P	1864	49/3	65/9	91/9	17,084,200
Royal Exchange Assurance Corporation, Royal Exchange, E.C. and 44, Pall Mall, S.W. 1. <i>Act.</i> , H. E. Nightingale, F.I.A. P	1720	49/-	64/9	90/2	4,879,672
Royal Insurance Co. Ltd., 1, North John St., Liverpool. <i>Gen. Man.</i> , G. Chappell. London Offices, 24-28, Lombard Street. <i>Sec.</i> to London Board, R. McCunnell P	1845	48/8	64/4	90/4	12,906,122
Scottish Amicable Life Assurance Society, St. Vincent Place, Glasgow. <i>Gen. Man.</i> , W. Hutton. <i>Sec.</i> , C. Guthrie. London Office, 1, Threadneedle St., E.C. 2. <i>Sec.</i> , H. Robertson M	1826	51/9	66/3	90/1	6,800,492
Scottish Equitable Life Assurance Society, 28, St. Andrew Square, Edinburgh. <i>Man. & Act.</i> , G. M. Low. <i>Sec.</i> , J. M. Warden. London Office, 13, Cornhill, E.C. 3. <i>Sec.</i> , P. W. Purves M	1831	50/-	65/5	90/6	6,256,259
Scottish Life Assurance Co. Ltd., 19, St. Andrew Square, Edinburgh. <i>Man.</i> , Lewis P. Orr, F.R.S.E. London Office, 9 & 10, King St., E.C. 4. <i>Sec.</i> , I. Campbell P	1881	49/5	64/6	90/5	2,867,306
Scottish Provident Institution, 6, St. Andrew Square, Edinburgh. <i>Man.</i> , R. T. Boothby. <i>Joint Secs.</i> , C. W. Thomson, & A. Graham Donald. <i>Act.</i> , W. G. Walton. London Offices, 3, Lombard St. E.C., and 17, Pall Mall, S.W. M	1837	42/4	56/6	83/2	16,250,000
Scottish Temperance & British General Assurance Co., Ltd., 10, St. Vincent Street, Glasgow. <i>Manager</i> , Adam K. Rodger. London, 2, 3 & 4, Cheapside. <i>Man.</i> , R. J. Moss. Less 10 per cent to Whole Life Abs'ainers P	1883	48/6	63/9	89/10	2,006,205
Scottish Union & National Insurance Co., 35, St. Andrew Square, Edinburgh. <i>Gen. Man.</i> , J. A. Cook. London Office, 5, Walbrook, E.C. 4. <i>Sec.</i> , James G. Nicoll P	1824	50/-	65/8	92/-	8,266,845
Scottish Widows' Fund Life Assurance Society, 9, St. Andrew Square, Edinburgh. <i>Man. & Act.</i> , G. J. Lidstone. <i>Sec.</i> , Geo. C. Stenhouse. London Offices, 28, Cornhill, E.C. 3, and 17, Waterloo Place, S.W. 1. M	1815	51/9	66/3	90/7	22,490,776

A, When Established; B, C, D, Annual Premiums to Insure £100 on death, with Profits, at the age of 30, 40, and 50; E, Assurance and Annuity Funds, exclusive of Paid-up Capital; M, Mutual Offices; P, Proprietary Offices.

Those marked with an asterisk (*) in the E column have not returned our last form, but we give their latest revised figures.

NAME, ETC., OF OFFICE.	A	B	C	D	E
Standard Life Assurance Co., 3, George Street, Edinburgh. <i>Man. & Sec.</i> , S. E. Macnaghten. London Offices, 83, King William St., <i>Sec.</i> , A. B. Drayton, and 15a, Pall Mall, <i>Sec.</i> , E. V. Goodall P	1825	48/11	64/5	89/-	£ 14,100,000
Sun Life Assurance Society, 63, Threadneedle Street, E.C. <i>Sec. & Gen. Man.</i> , E. Linnell. <i>Act.</i> , R. G. Salmon, F.I.A. <i>Assistant Sec.</i> , G. M. Searle, F.I.A. .. P	1810	49/2	66/6	94/2	12,324,879
Sun Life Assurance Co. of Canada, Canada House, 4 & 5, Norfolk Street, W.C. <i>Man.</i> , J. F. Junkin P	1865	48/5	65/4	94/1	*19,410,081
United Kingdom Provident Institution, 196, Strand, W.C. <i>Sec.</i> , H. W. Hasler. <i>Act.</i> , C. Cosmo Monkhouse, B.A., F.I.A. <i>Asst. Act.</i> , W. G. Barrett, F.I.A. .. M	1840	49/6	65/-	91/10	11,063,54-
University Life Assurance Society, 25, Pall Mall, S.W.1. <i>Act. & Sec.</i> , R. Todhunter, M.A. P	1825	52/4	68/9	94/10	863,286
Wesleyan & General Assurance Society, Life, Annuities, Sickness, Assurance Buildings, Steelhouse Lane, Birmingham. <i>Gen. Man.</i> , A. L. Hunt. London Office, Haulton House, 20-23, Holborn, E.C. Further particulars see page 8 .. M	1841	48/1	65/3	93/10	3,638,133
Yorkshire Insurance Company, Ltd., Chief Offices: St. Helen's Square, York. Bank Buildings, Princes Street, E.C. London Branches, 48, Pall Mall, S.W.1; 49, Sloane Square, S.W.1; 132, Newington Crescent, S.E.1; 6, Norfolk Street, Strand, W.C.2; 43, Broadway, Stratford, S.E.15; 551, High Road Tottenham, N.17; 280, Euston Road, N.W.1. Further particulars see page 2 P	1824	49/1	64/9	91/7	3,550,043

EDUCATION !

£150 a year for 5 years, from the time your child is 15, will help to provide that type of education without which it is well-nigh impossible to attain a leading position in the world, under the stress of modern competition.

The father, aged 32, with a child not yet 12 months, may obtain such annuity, paid quarterly, at an annual cost of less than £33 for 15 years; while should he die during that period, at least **£600** will be paid to his estate, in lieu of the annuity.

All ages, amounts, and types of Life Policies quoted for. Apply to—

ERNEST TIDSWELL, M.A. (Oxon.), F.F.I., *Life Assurance Consultant,*

Telephone: 1136 HORNSEY.

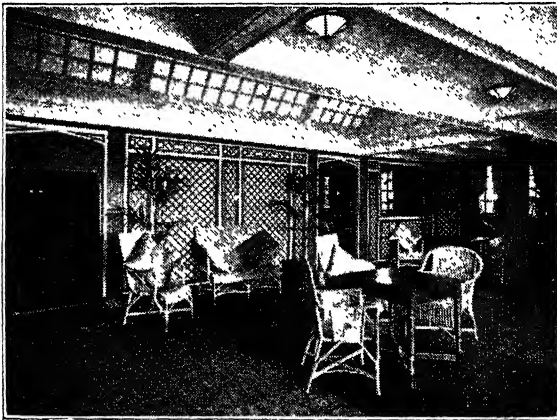
9 GLASSLYN ROAD, LONDON, N.8



FOR YOUR HEALTH
:: :: GO TO SEA :: ::

BY

R. M. S. P.



Winter Garden—R.M.S.P. "Almanzora."

:: SERVICES BETWEEN ::
 THE UNITED KINGDOM

SOUTH AMERICA

PENINSULA ATLANTIC ISLANDS

NEW YORK

18 Moorgate Street, E.C.2, & 32 Cockspur Street, S.W.1.
LONDON.

WESLEYAN & GENERAL ASSURANCE SOCIETY.

Principal Office :

Assurance Buildings, Steelhouse Lane, BIRMINGHAM.

Branch Offices in all the Principal Towns, and Agencies throughout the Kingdom.

LONDON BRANCH OFFICE,	HALTON HOUSE, 20-23 HOLBORN, E.C.
MANCHESTER	„ LLOYDS BANK BUILDINGS, KING STREET
LIVERPOOL	„ - LEITH BUILDINGS, 24 MOORFIELDS
GLASGOW	„ - 89 WEST REGENT STREET

Annual Income exceeds - - - £1,350,000

Claims Paid exceed - - - £10,000,000

All Classes of LIFE ASSURANCE and ANNUITY BUSINESS Transacted.
Under the latest Tables ANNUAL BONUS of **£3 %** IS GUARANTEED.

Prospectuses and Quotations to meet individual requirements may be obtained on application.

A. L. HUNT, F.S.S., F.C.I.I., General Manager.

BRITANNIC Assurance Co. Ltd.

ESTABLISHED 1866.

Annual Income - £2,300,000

Total Funds - £5,800,000

Total Claims Paid - £14,800,000

All Classes of LIFE ASSURANCE Business transacted.

ATTRACTIVE UP-TO-DATE TABLES.

CHIEF OFFICES :

Broad Street Corner, BIRMINGHAM.

2,000 YEAR-OLD WISDOM

"All men, when prosperity is at its height, ought then to ask themselves in what way they shall endure disaster."—TERENCE, Phormio.

THE wisdom expressed over 2,000 years ago, by the famous old Roman Poet and Dramatist, has lost none of its significance to-day.

Terence, through literary ability, rose from the position of Slave to be one of the most honoured men in Rome. During his career he must have experienced poverty and probably adversity. Hence his warning to the prosperous!

Men and Women to-day in the height of their prosperity should give thought to this. Business now good may go wrong. Advancing age or illness may incapacitate the most willing worker. Uncontrollable circumstances may place the one-time prosperous in a condition of penury. But the man (or woman) possessing an adequate endowment assurance policy can face the future with equanimity. He can be certain of receiving if alive a capital sum at the age of 50 or 55 (which, if desired, could then be commuted into an assured income for life). During the whole period in which he is accumulating this fund for his retirement he is also affording provision for his wife and family. Because, should he unfortunately die before the policy matures, the whole capital sum, together with the profits due to that date, would be paid without further liability to the person or persons entitled thereto.

Endowment assurance is recognised by shrewd business men and women as the best possible investment. If best for them, it must be good for you.

Particulars of this ideal form of Investment can be obtained at any of the "British Dominions" branches, or from the:—

LIFE DEPARTMENT,

West End
Branch:
79 Pall Mall
S.W.1.

EAGLE STAR & COMPANY LTD
BRITISH DOMINIONS
INSURANCE COMPANY LTD

Branches
and Agents
throughout
the United
Kingdom.

32 MOORGATE STREET, LONDON, E.C.2

HEAD OFFICE: BRITISH DOMINIONS HOUSE,
ROYAL EXCHANGE AVENUE, LONDON, E.C.3.

ASSETS EXCEED £19,000,000

General Life Assurance Co.

ESTABLISHED 1837.

FUNDS EXCEED - - - £2,000,000

BOARD OF DIRECTORS:

Chairman—ALFRED JAMES SHEPHEARD, Esq.

Deputy Chairman—C. E. VERNON RUTTER, Esq.

H. J. BRACEY, Esq.

Rt. Hon. Lord FARRER

Capt. Hon. E. A. FITZROY, M.P.

JOHN ROBERT FREEMAN, Esq.

Rt. Hon. Sir C. E. H. HOBHOUSE, Bart.

D. C. RUTHERFORD, Esq., J.P.

E. J. HOILAND, Esq., J.P.

MEDICAL OFFICER:

HERBERT FRENCH, C.B.E., M.A., M.D., 62 Wimpole Street, W.

Advances made on Reversions, Life Interests, and on Personal Security
in connection with a Life Policy. Six per cent Permanent Reduction
to Medical Men upon With-Profit tables

103 Cannon Street,
LONDON, E.C. 4

ALBERT BURTON NYE, *Secretary.*

***The* CO-OPERATIVE Insurance Society Ltd.**

(THE JOINT INSURANCE DEPT. OF THE ENGLISH AND
SCOTTISH CO-OPERATIVE WHOLESALE SOCIETIES)
TRANSACTS

*Life Assurance, Annuities, and Endowments,
and all forms of Insurance.*

Over a thousand claims dealt with every week.

WRITE FOR PROSPECTUS TO—

Chief Office: 109 CORPORATION STREET, MANCHESTER.

NEWCASTLE-ON-TYNE: 84 Westmorland Rd.

LEEDS: Crown Chambers, 9 Albion Street.

GLASGOW: 50 Morrison Street.

BIRMINGHAM: 16 Pershore Street

CARDIFF: 113-116 St. Mary Street

LONDON: 14, Red Lion Sq., Holborn, W.C.1

NOTTINGHAM: 5 Friar Lane

BIBBY LINE==== to Egypt, Ceylon & Burma.

Only FIRST-CLASS Passengers Carried.

Full set of Instruments and Drugs supplied.

Length of Voyage - about 2½ months.

SURGEONS DESIRING APPOINTMENTS

should apply to **BIBBY BROS. & CO.,**

10/11 Mincing Lane, London, E.C.3, or 26 Chapel St., LIVERPOOL

If you desire the most profitable Life Assurance
Contract it will pay you to get a Prospectus from the

AUSTRALIAN MUTUAL PROVIDENT SOCIETY

Est. (A.M.P.) 1849.

THE LARGEST BRITISH MUTUAL LIFE OFFICE.

Assets, £42,000,000	|	Annual Income, £6,000,000
New Ordinary Business for 1919	-	£9,500,000
Total Ordinary Assurances in Force	-	£122,000,000

PURELY MUTUAL. ALL Profits belong to POLICY-HOLDERS.

— EVERY YEAR A BONUS YEAR. —

CASH SURPLUS (Ordinary Department) divisible for 1919 - £1,197,000

Individual Bonuses equal to those of 1914.

No Suspension of Annual Bonuses during War.

London Office: 37 THREADNEEDLE STREET, E.C.2

W. C. FISHER, *Manager for the United Kingdom,*

PRUDENTIAL

ASSURANCE COMPANY, LTD.

HOLBORN BARS, LONDON, E.C.1

President: Sir THOMAS DEWEY, Bart.

Directors:

ALFRED CORDEROY THOMPSON, Esq., *Chairman.*

EDGAR HORNE, Esq., M.P., *Deputy-Chairman.*

JOHN IRVINE BOSWELL, Esq., M.D.

GUY PHILIP HARBEN, Esq., O.B.E.

Sir WILLIAM LANCASTER

Sir JOHN HENRY LUSCOMBE

JAMES MOON, Esq.

WILLIAM THOMAS PUGH, Esq.

FREDK SCHOOLING, Esq., F.I.A.

DANIEL WINTRINGHAM

STABLE, Esq.

Secretary: Sir GEORGE MAY, K.B.E., F.I.A.

Deputy Secretary: W. C. SHARMAN, Esq., F.I.A.

Deputy Actuary: F. P. SYMONS, Esq., F.I.A.

Deputy General Managers: A. R. BARRAND, Esq., M.P., F.I.A., E. DEWEY, Esq., H. R. GRAY, Esq.

General Manager and Actuary: Sir JOSEPH BURN, K.B.E., F.I.A.

The PRUDENTIAL transacts every description of LIFE, FIRE, ACCIDENT, BURGLARY, and ANNUITY Business, and is also prepared to act as TRUSTEE or EXECUTOR in connection with Settlements and Bequests.

INVESTED FUNDS EXCEED	-	£115,000,000
CLAIMS PAID	-	£180,000,000

The Last Annual and Valuation Reports can be had on application.



SWAIN'S BLOCKS

FOR ILLUSTRATING

JOHN SWAIN & SON LTD.

LONDON: 89-90 SHOE LANE, E.C.
GLASGOW: 332, Argyle Street.
MANCHESTER: 10, New Brown Street.
BRISTOL: 43, Broad Street.
PARIS: 34, Bde. des Italiens.
Works: BARNET.

PHOTO-ENGRAVERS &
ART REPRODUCERS BY
ALL PROCESSES

Telephone - 6633 HOLBURN.

**Shorthand,
Duplicating,**

**Typewriting,
Translations**

accurately and efficiently undertaken.

IVATTS & YOUNG,

TYPEWRITING OFFICE,

PENYWERN ROAD, (Corner of Earl's Court Road),

LONDON, S.W. 5

Telephone No. Western 76.

MEDICAL TYPEWRITING and SECRETARIAL WORK.

TRANSLATIONS FROM GERMAN AND
— FRENCH MEDICAL LITERATURE. —

THE MISSES ERWIN, 20 Hanover Sq., London, W.1

Engaged in work for the Medical Profession since 1888.

THE
ART RÉPRODUCTION Co.
LIMITED,

3 & 4 Plough Court, Fetter Lane,

Telephones :
Holborn
5597 & 5598.

LONDON, E.C.4

Telegrams :
"Perquisite,
London."

**SPECIALISTS IN
MEDICAL
ILLUSTRATIONS**

We have an entirely separate department of Experts for this extremely important work, and guarantee accurate Reproductions in Colour and Black and White by all processes.

Your enquiry, however small, will always receive instant attention.

MAY WE SERVE YOU ?

We Specialise in Medical and Scientific Books

and have always a very complete stock,
enabling us to fill orders promptly, and
———on the best terms.———

See our Catalogues and Lists of Current Books sent post free.

WILLIAM BRYCE

MEDICAL & SCIENTIFIC BOOKSELLER,
**50-54a,
LOTHIAN STREET, EDINBURGH.**

Special attention to the forwarding of Books and Journals abroad.

The Prescriber

**A Monthly Journal on Treatment for the General
Practitioner.**

THE PRESCRIBER records all the latest developments in Treatment, whether by Drugs, Vaccines, Chemo-therapy, Serums, Radio-therapeutics, Electricity, or other method. Original Articles, Collective Abstracts, Bibliographies, Book Reviews, Editorials, and Notes all deal with this subject.

There is no more comprehensive guide to Treatment in the English language, and the Yearly Volume forms a perfect Book of Reference.

Annual Subscription 20s. post free.

SPECIMEN FREE.

Offices: 6 SOUTH CHARLOTTE STREET, EDINBURGH.

BOOKS.

DEIGHTON, BELL & Co. Ltd.

University and Export Booksellers,
13 TRINITY STREET, CAMBRIDGE, England,

Carry a large representative stock of English and Foreign Books (New and Secondhand) in all Departments of Literature. They have special facilities for procuring Out-of-Print and Scarce Books, and will be pleased to quote prices at any time on customers stating their wants.

**Agents for the Publications of the
Cambridge University Press.**

Medical and Scientific **BOOKS**

A large up-to-date Stock always in hand.
Lists free on application. Scarce Books
and back-date Medical Journals sought
for and reported free.

JAMES GALLOWAY,
3 Teviot Place, EDINBURGH.

Telephone No.: 8321 Central.

(Opposite M'Ewan Hall.)

ELLIS'S MEDICAL LIBRARY

NEW BOOKS OF ALL PUBLISHERS
SUPPLIED, CAREFULLY PACKED,
— BY RETURN OF POST —

Telephone:—
City 8281.

EXCELLENT CATALOGUES

Free upon application.

Complete Stock of Latest Editions

MEDICAL AND SURGICAL WORKS
— OF ALL PUBLISHERS —

CARRIAGE-PAID LIBRARY

Circulating all over the World.



Telegrams:—
"Nubooque, C.e.it,
London."

Call or write for terms:—

H. R. ELLIS, Medical Bookselling Specialist,

9 Lovell's Court, Paternoster Row, E.C.4.

(100 yards from St. Paul's Cathedral.)

HILTON & CO.'S MEDICAL PUBLICATIONS. JUST PUBLISHED.

EIGHTH EDITION. Crown 8vo. Full cloth. Rs. 6 or 10/6 net.

Dr. R. GHOSH'S **MATERIA MEDICA**

By Lt.-Col. B. H. DEARE, I.M.S., Professor of Materia Medica and Therapeutics, Medical College of Bengal, and B. N. GHOSH, F.R.F.P.S. (Glasg.).

The book is thoroughly revised to correspond to B.P. 1914.

THE LANCET: "The book is a valuable compendium."

THE DUBLIN JOURNAL OF MEDICAL SCIENCE: "This is one of the best for ready reference."

Fourth Edition. With Illustrations. Crown 8vo. Full cloth. Rs. 5.8 or 7/6 net.

HYGIENE & PUBLIC HEALTH

With Special Reference to the Tropics.

By B. N. GHOSH, F.R.F.P.S. (Glasg.), Fellow of the Royal Society of Medicine; and J. L. DAS, D.P.H. With an Introduction by Col. K. McLEOD, M.D., LL.D., I.M.S. (Rtd.), Hon. Physician to H.M. the King.

INDIAN MEDICAL GAZETTE: "An admirable text-book for students and practitioners."

THE LANCET: "Contains a large amount of necessary information on practical sanitation and the theory of hygiene."

Publishers: HILTON & CO., College Street, Calcutta. Telegrams: "Therapy, Calcutta."
London Agents: SIMPKIN & MARSHALL, Stationers' Hall, E.C.4

Demy 8vo. With 82 Original Illustrations. 6/6 net; Postage 4d.

LATERAL CURVATURE OF THE SPINE, AND FLAT FOOT: And their Treatment by Exercises.

By J. S. KELLETT SMITH, F.R.C.S., Late Demonstrator of Anatomy, University of Liverpool.

"This is eminently a book suited for the general practitioner wishing to treat the slighter forms of scoliosis or pes planus."—*Lancet*.

BRISTOL: JOHN WRIGHT & SONS LTD. London: Simpkin & Co. Ltd.

G. P. PUTNAM'S SONS' Publications

RADIANT MOTHERHOOD.

A Book for Those who are Creating the Future.

By MARIE C. STOPEs, D.Sc., Ph.D.

6s. net, postage 6d.

"Dr. Stopes' new book will have as many admirers as her former works have had . . . and fewer enemies. To be sure, there will be critics, for the teaching is too challenging to pass unheeded. At least her critics must admit that Dr. Stopes has a high ideal of motherhood and a real literary gift."—*Lancet*.

MARRIED LOVE.

A new Contribution to the Solution of Sex Difficulties.

By MARIE STOPEs.

6s. net, postage 6d.

WISE PARENTHOOD

A Treatise on Birth Control: A Book for Married People.

By MARIE STOPEs.

3s. 6d. net, postage 4d.

The CONTROL of PARENTHOOD

By Prof. J. ARTHUR THOMSON, M.A., LL.D.; Prof. LEONARD HILL, M.D., F.R.S.; The Very Rev. DEAN INGE, C.V.O., D.D.; Mr. HAROLD COX (Editor *Edinburgh Review*); Dr. MARY SCHARLIEB, C.B.E., M.D., M.S.; Sir RIDER HAGGARD, K.B.E.; Rev. Principal A. F. GARVIE, M.A., D.D.; Rev. F. B. MEYER, B.A., D.D.; Dr. MARIE STOPEs, D.Sc., Ph.D., F.L.S. Introduction by the BISHOP of BIRMINGHAM. Edited by JAMES MARCHANT, C.B.E., LL.D., F.L.S., F.R.S. Ed. Secretary of the National Birth-Rate Commission, etc.

7s. 6d. net, postage 6d.

24, Bedford St., Strand, LONDON, W.C.2

CLINICAL LECTURES

By HENRY CURTIS, B.S. & M.D. (Lond.), F.R.C.S. (Eng.),

Surg. to the Metrop. Hosp., London, E.8; Consult. Surg. to the Nat. Sanat. Assoc., Lond.; late Surg. to the Enfield Road Military Hosp., E.8; and to the Hosp. for Facial Injuries, Brook St., W.1; Consult. Surg. V.A.D. Hosp., Cranbrook; formerly Teacher of Operative Surg., Lond. Sch. of Clin. Med.

CASES OF ABDOMINAL SURGERY, including some rare forms of Intestinal Obstruction. Illustrations.	Price 2s. net
LIVER ABSCESSSES: Their Etiology, Symptoms, and Treatment.	Price 1s. net
ON GUMMATA: The Clinical Features and Treatment of the less obvious Varieties, with a Record of Eight Cases. Thirteen Illustrations	Price 2s. net
INTERESTING CASES OF CRANIAL SURGERY. Illustrated.	Price 2s. net

London: THE MEDICAL PUBLISHING CO. Ltd., 23 Bartholomew Close, E.C.1

THIRD EDITION. Price 4/6 net.

INTENSIVE TREATMENT OF SYPHILIS

and Locomotor Ataxia by Aachen Methods (with Notes on Salvarsan).

By REGINALD HAYES, M.R.C.S.

THE LANCET says:—"No better exposition of the method as practised at Aachen can be found than that contained in this little work."

BAILLIERE, TINDALL & COX, 8 Henrietta St., Covent Garden, LONDON, W.C.2

3rd EDITION. Demy 8vo. viii. + 248 pages. Price 12/6 net.

THE TREATMENT OF DISEASES OF THE SKIN.

Illustrated with 39 Original Photographs, and 156 Special Prescriptions.

By W. KNOWSLEY SIBLEY, M.A., M.D., B.C. (Camb.), M.R.C.P., Physician to St. John's Hospital for Diseases of the Skin, London.

LONDON: EDWARD ARNOLD, 41, Maddox Street, W.1

By **Lieut.-Col. ROBERT HENRY ELLIOT**,
M.D., B.S.(Lond.), D.Sc.(Edin.), F.R.C.S.(Eng.), I.M.S. Rtd.

GLAUCOMA: A Handbook for the General Practitioner

Published 1917. Pp. xi + 57. 13 Illustrations. Demy 8vo. 4/- net.

"An excellent summary of the subject in a small compass."—*British Journal of Ophthalmology*.

GLAUCOMA: A Textbook for the Student of Ophthalmology.

25/- net.

1918. Pp. xvi + 546. With 158 Illustrations. Demy 8vo.

The INDIAN OPERATION of COUCHING FOR CATARACT. Incorporating the Hunterian Lectures delivered before the Royal Coll. of Surgeons of England, Feb. 19 & 21, 1917.

Pp. xii + 91. With 45 Illustrations. Royal 8vo. 7/6 net.

H. K. LEWIS & CO. Ltd., 136 Gower Street, LONDON, W.C.1

SCLERO-CORNEAL TREPHINING in the Operative Treatment of Glaucoma.

Second Edition, 1914. 7/6.

"The book should be carefully studied by every Ophthalmic surgeon."—*Lancet*.

"The book ought to take a foremost place in Ophthalmological literature."—*The Practitioner*.

GEORGE PULMAN & SONS, Ltd., LONDON.

TROPICAL OPHTHALMOLOGY. With 7 Plates, and 117 Illustrations, 31/6

THE OXFORD MEDICAL PUBLICATIONS.

AN ATLAS

ILLUSTRATING THE TOPOGRAPHICAL ANATOMY OF THE

Head, Neck and Trunk

By **JOHNSON SYMINGTON, M.D., F.R.C.S., F.R.S.**

Emeritus Professor of Anatomy, The Queen's University of Belfast.

Price £6 6s. net.

THIS Atlas contains 34 detached plates, mounted on cloth and varnished, of 36 horizontal sections through the head, neck, thorax, abdomen and pelvis, with 7 reconstructions, also life-size. The plates are enclosed in a Portfolio, from which any of them can be taken and placed beside one another to facilitate the comparison of the position of the structures shown in adjacent sections.

All the illustrations are printed from half-tone blocks made with fine screens from the original drawings. The reconstructions show the position of the sections from various aspects in relation to the surface of the body, and the skeleton and other internal organs.

This work was originally designed for use in the Operating Theatres and X ray departments of Military Hospitals and Casualty Stations; but it is also adapted for general use as an Atlas of Topographical Anatomy in which the clinician will find an extensive series of life-size pictures of the position and relations of the various organs of the body.

OBSTETRICS and GYNÆCOLOGY

Price 10s. net.

By **JOHN CAMPBELL, M.A., M.D., F.R.C.S.Eng., LL.D.**

MAYNE, BOYD & SON, Ltd., Printers to the University, **BELFAST.**

BY
W. McADAM ECCLES, M.S. (Lond.), F.R.C.S. (Eng.),
Surgeon St. Bartholomew's Hospital, etc.

Third Edition. Many new Illustrations. Price 7s. 6d. net.

HERNIA : Its Etiology, Symptoms, and Treatment.

Jacksonian Prize Essay. Profusely Illustrated. Price 7s. 6d. net.

THE IMPERFECTLY DESCENDED TESTIS.

BAILLIERE, TINDALL & COX, 8 HENRIETTA STREET,
 COVENT GARDEN, W.C. 2

SOME POINTS IN THE PATHOLOGY OF APPENDICITIS. Illustrated by Six Micro-Photographs.

BALE, SONS & DANIELSSON, LTD., GT. TITCHFIELD STREET, W.1

SECOND EDITION OF CECIL WEBB-JOHNSON'S Price 10/6 net. **TWILIGHT SLEEP.** Postage 6d.

FOREWORD BY COMYNS BERKELEY, M.C., M.D., F.R.C.P.,
Obstetric and Gynaecological Surgeon to Middlesex Hospital.

Including ALL THE LATEST WORK IN ENGLAND ON THE SUBJECT.

REVIEWS OF FIRST EDITION.

THE HOSPITAL:—"We have never found the argument more successfully presented than in this book, and we will venture to offer Capt. Webb-Johnson a compliment on the literary quality of his pages. He tells us what he himself has seen and done, and he does this in a most engaging fashion."
 THE ANTISEPTIC:—"Medical men will do well to study this book, and the technique propounded therein."

BUTTERWORTH & CO., Bell Yard, Temple Bar, LONDON, W.C. 2

By **P. LOCKHART MUMMERY, F.R.C.S.,**
Senr. Surg. St. Mark's Hosp. for Diseases of the Rectum, & Queen's Hosp., Hackney.

DISEASES OF THE RECTUM and ANUS.

THE SIGMOIDOSCOPE. Price 3/6.

DISEASES OF THE COLON.

BAILLIERE, TINDALL & COX, 8 Henrietta St., Covent Garden, LONDON, W.C. 2

FOURTH EDITION, with Illustrations. 8vo. 10s. 6d.

On Deafness, Giddiness, & Noises in the Head

By **EDWARD WOAKES**, M.D. (Lond.), late Sen. Aural Surg., London Hosp., Lect. on Dis. of the Ear, Lon. Hosp. Med. Coll.; assisted by **CLAUD WOAKES**, M.R.C.S., L.R.C.P., Surg. to the Lon. Throat Hosp.

"It is clearly written, and contains much that is likely to be most useful from the point of view of Treatment."—*British Medical Journal*.

"Other chapters deal with progressive deafness, furuncle, post-nasal growths, the ear affections of infancy, etc., and are written with the same logical and scientific acumen so eminently characteristic of the book."—*The Journal of Medical Science*, January, 1900.

LONDON: H. K. LEWIS, 136, GOWER STREET, W.C.

The Diagnosis of Nervous Diseases

By Sir **JAMES PURVES STEWART**, K.C.M.G., C.B., M.D., F.R.C.P.

Senior Physician to the Westminster Hosp.; Consulting Physician to the West End Hosp. for Nervous Diseases, etc., etc.

"As an introduction to clinical neurology it has no superior."—*The Lancet*.

Fifth Edition. Revised and Enlarged. 584 + viii. pages. With 3 Plates and 298 Original Illustrations, many of which are in Colours. Price 30s. net.

LONDON: Edward Arnold, 41 Maddox Street, W-1.

Syphilis and Venereal Diseases

By **C. F. MARSHALL**, M.D., M.Sc., F.R.C.S., and
E. G. FFRENCH, M.D., F.R.C.S. Edin., Lieut.-Col., R.A.M.C. (Retd.).

Being the **FOURTH EDITION** of
"SYPHILOLOGY AND VENEREAL DISEASE."

With 7 Coloured Plates and 90 Figures.

PRICE 25s. NET.

LONDON: BAILLIÈRE, TINDALL & COX. [1921.]

Price 10s. 6d.

Hypnotic Suggestion & Psycho-Therapeutics

By **A. BETTS TAPLIN**, L.R.C.P. & L.M. (Edin.),

Member, and late President Psycho-Medical Society of Great Britain.

AUTHOR OF "HYPNOTISM."

LITTLEBURY BROS., LIVERPOOL. SIMPKIN, MARSHALL & CO. LTD., LONDON.

CHARTS and Chart Holders, Medical Account Books, Collectors' Books and Cards, Dispensing Labels, Certificate Books, and Prescription Books.

Specimens Free on application.

JOHN WRIGHT & SONS Ltd., BRISTOL.

1,000,000 Vols. in
stock.

BOOKS

On every conceivable
subject.

Medical, Surgical, and Nursing Works a Speciality.

Second-hand and New.

Catalogues Free. State Wants.
Books sent on approval.

BOOKS (Whole Libraries or Small Collections) Purchased, Best Prices given.

W. & G. FOYLE, LTD.,

121-125 Charing Cross Road, LONDON, W.C.2.

Telegrams: "FOYLIBRA, OX, LONDON."

BAILLIÈRE, TINDALL & COX.

Blair Bell's The Sex Complex

A Study of the Relationship of the Internal Secretions of the Female Characteristics and Functions in Health and Disease.

2nd Edition. Royal 8vo. Pp. xviii. + 251. With 61 Plates, of which 8 are Coloured.
 PRICE 21s. NET.

Marshall & Ffrench's Syphilis and Venereal Diseases

Being the 4th Edition of "Syphilology and Venereal Diseases."

Demy 8vo. Pp. xii. + 434. With 90 Illustrations and 7 Coloured Plates.
 PRICE 25s. NET.

Grimsdale & Brewerton's Ophthalmic Operations

"This work, the only one of its kind on this special subject, in any language, is a most valuable one."—*British Medical Journal*.

2nd Edition. Demy 8vo. Pp. viii. + 433. With 129 Illustrations. PRICE 21s. NET.

Laroquette's Atlas of Electro-Diagnosis and Therapeutics

Translated by MARY CHEETHAM, Dame Infirmière Militaire; Médaille de la Reconnaissance Française. With foreword by ROBERT KNOX, M.D.

Demy 8vo. Pp. xvi. + 180. With 69 Plates and Illustrations. PRICE 15s. NET.

Geikie Cobb's Manual of Neurasthenia

"We recommend Dr. Cobb's book . . . And he will be blessed by the worried physician for having devoted almost one-half of his book to treatment."—*Lancet*.

Demy 8vo. Pp. xvi + 365. PRICE 15s. NET.

Brooke's Marine Hygiene and Sanitation

A Manual for Ships' Surgeons and Port Health Officers.

"This is a book which no ship's surgeon or port medical officer should be without."—*Siren and Shipping*.

Pp. x + 409. With 4 Coloured Plates and 26 other Illustrations.
 PRICE 15s. NET, postage 6d.

Overbeck-Wright's Lunacy in India

By A. W. OVERBECK-WRIGHT, M.D., Ch.B., D.P.H., Major I.M.S., Superintendent, Lunatic Asylum, Agra; Lecturer on Mental Diseases to King George's Medical College, Lucknow, and to Agra Medical School, Agra.

Demy 8vo. Pp. xli + 405. PRICE 21s. NET.

BAILLIÈRE, TINDALL & COX,

8 Henrietta Street, COVENT GARDEN, LONDON, W.C.2.

LEWIS'S PRACTICAL SERIES.

"Lewis's excellent 'Practical Series'"—*The Lancet*.

DISEASES OF THE NOSE AND THROAT. By HERBERT TILLEY, B.S.(Lond.), F.R.C.S.(Eng.). Fourth Edition, with numerous Illustrations. Demy 8vo. 28s. net

MIND AND ITS DISORDERS. By W. H. B. STODDART, M.D., F.R.C.P. Third Edition, thoroughly revised, and largely re-written. With Plates and other Illustrations. Demy 8vo. 20s. net

HYGIENE AND PUBLIC HEALTH. By L. C. PARKES, M.D., D.P.H., etc., and H. R. KENWOOD, C.M.G., M.B., F.R.S. (Edin.), etc. Sixth Edition, (Reprinted) with Plates and other Illustrations. 22s. 6d. net

MEDICAL ELECTRICITY: A Practical Handbook for Students and Practitioners. By the late H. LEWIS JONES, M.A., M.D., F.R.C.P. Edited by LULLUM WOOD BATHURST, M.D., (Lond.). Eighth Edition. Revised and Enlarged, with numerous Plates and Illustrations. Demy 8vo. 22s. 6d. net

PUBLIC HEALTH LABORATORY WORK. (Chemistry.) By HENRY R. KENWOOD, C.M.G., M.B., D.P.H., F.C.S. Seventh Edition. 6 Plates and 87 Illustrations. Demy 8vo. 15s. net

ANÆSTHETICS: Their Uses and Administration. By DUDLEY W. BUXTON, M.D., B.S., M.R.C.P. Sixth Edition. With Plates and other Illustrations. Demy 8vo. 21s. net

CLINICAL BACTERIOLOGY AND HÆMATOLOGY FOR PRACTITIONERS. By W. D'ESTE EVERY, M.D., B.Sc.(Lond.). Sixth Edition, thoroughly Revised, with additional matter, with 11 Plates (4 Coloured), and 55 other Illustrations. Demy 8vo. (Just Published)

** Complete Catalogue of Publications post free on application.

London : H. K. LEWIS & CO. Ltd., 136 Gower Street, W.C.1
Publishing and Wholesale: 28 GOWER PLACE, W.C.1

H. K. LEWIS & CO. Ltd., Medical Publishers & Booksellers.

Complete Stock of Text-books and Recent Literature
— in all branches of Medical and General Science. —
PROMPT ATTENTION TO ORDERS BY POST from all parts of the World.

Large stock of **SECOND-HAND** books always available.

EXTENSION for this Department **140 GOWER STREET.**

Price List post free on application.

MEDICAL AND SCIENTIFIC CIRCULATING LIBRARY.

Annual Subscription, Town or Country, from ONE GUINEA.

MEDICINE, SURGERY, and all Departments of GENERAL SCIENCE.

LIBRARY READING ROOM (1st Floor) Open Daily. *

LIBRARY CATALOGUE, revised to Dec. 1917, with Supplement 1918-20, including list of Subjects and Authors. 564 pp., demy 8vo. 12/6 net (to subscribers 8/- net).

SUPPLEMENT 64 pp.—1918-1920, separately 1/- net, post. 2d. Just published.

136 GOWER STREET } LONDON, W.C.1
& 24 GOWER PLACE, }

BUSINESS HOURS: 9 a.m. to 6 p.m.; Saturdays to 1 p.m.

LEWIS'S PUBLICATIONS.

SEVENTEENTH EDITION.

VOL. I. 27s. net, postage 6d.

THE EXTRA PHARMACOPŒIA

By MARTINDALE and WESTCOTT.

VOLUME II. Experimental Investigations; Methods of Assay; Composition of Proprietary Medicines, Mineral Waters, Radiology, Clinical Analyses, Bacteriological notes on Special Diseases, etc. Nearly Ready.

"One of the few books which Medical Practitioner, Analyst, and Pharmacist cannot afford to be without." *Lancet*.

DISEASES OF THE SKIN. A Text-book for Students and Practitioners.

By J. M. H. MACLEOD, M.A., M.D., F.R.C.P. With 14 Coloured Plates and 435 other Illustrations, Plates, etc., in the Text. Royal 8vo. 70s. net

ON DISEASES OF THE LUNGS AND PLEURÆ, INCLUDING

TUBERCULOSIS AND MEDIASTINAL GROWTHS. By SIR RICHARD DOUGLAS POWELL, Bart., K.C.V.O., M.D. Lond., F.R.C.P., and SIR P. HORTON-SMITH HARTLEY, C.V.O., M.D. Camb., F.R.C.P. Sixth Edition. Thoroughly revised with Plates from Original Drawings (6 in Colours) and many Illustrations in Text. Demy 8vo. 42s. net

ELEMENTS OF PRACTICAL MEDICINE. By A. H. CARTER, M.D.,

M.Sc., F.R.C.P. (Lond.). Eleventh Edition. Revised and Edited by A. G. GIBSON, M.D. (Oxon.), M.A., F.R.C.P. Crown 8vo. 16s. net

ANXIETY HYSTERIA. Modern Views on some Neuroses. By C. H. L.

IXON, M.D., M.R.C.S., and D. MATTHEW, M.C., M.B., Ch.B., with Foreword by COLONEL SIR A. LESLIE WEBB, K.B.E., C.B., C.M.G., &c. With Illustrations. Crown 8vo, 4s. 6d. net

SWANZY'S HANDBOOK OF DISEASES OF THE EYE, AND THEIR

TREATMENT. Revised and Edited by L. WERNER, F.R.C.S.I. New (Twelfth) Edition. With 9 Coloured Plates and 273 Text Illustrations. Demy 8vo. 24s. net

MILITARY PSYCHIATRY IN PEACE AND WAR. By C. STANFORD

READ, M.D. Lond., Physician, Fisherton House Mental Hospital, Salisbury. With 2 Charts, Royal 8vo. 10s. 6d. net

THE ACTION OF MUSCLES: including Muscle Rest and Muscle

Re-education. By WILLIAM COLIN MACKENZIE, M.D., F.R.C.S., F.R.S. (Edin.), Member of the Council of the Anatomical Society of Great Britain and Ireland, and of the Staff of the Military Hospital, Shepherd's Bush, London, etc. Reprint. Edited by CHARLES MACKAY, M.D. With 99 original Illustrations (including 16 Plates). Demy 8vo. 12s. 6d. net

THE THEORY AND PRACTICE OF MASSAGE. By BEATRICE M.

GOODALL-COPESTAKE, Instructress of Massage and Swedish Remedial Exercises to the Nurses of the London Hospital, etc. Third Edition, with additional Plates and other Illustrations. Demy 8vo. 12s. 6d. net

THE DIAGNOSTICS AND TREATMENT OF TROPICAL DISEASES.

By E. R. SMITH, A.B., Ph.G., M.D. Third Edition. With 86 Illustrations. Post 8vo. 15s. net

PRACTICAL BACTERIOLOGY, BLOODWORK, AND ANIMAL

PARASITOLOGY, with Bacteriological Keys, Zoological Tables, and Explanatory Clinical Notes. By E. R. SMITH, A.B., Ph.G., M.D. Sixth Edition. With numerous Illustrations. Post 8vo. 20s. net

NOTES ON GALVANISM and FARADISM. By ETHEL MARY MAGILL,

M.B., B.S. (Lond.), etc. Second Edition, with 70 Illustrations. Crown 8vo. 6s. net

LANDMARKS and SURFACE MARKINGS OF THE HUMAN BODY.

By L. BATHIE RAWLING, M.B., B.O. (Cantab.), F.R.C.S. (Eng.), Surgeon, Demonstrator of Operative Surgery at St. Bartholomew's Hospital. Fifth Edition. (Sixth Reprint), with 20 Plates (mostly in Colour), comprising 33 Figures. Demy 8vo. 6s. net

A GUIDE TO ANATOMY. For Students of Medical Gymnastics and

Massage. By E. D. EWART, Teacher's Certificate, Chartered Society of Massage and Medical Gymnastics; Examiner and Member of Chartered Society of Massage. With Plates and other Illustrations in the Text. Demy 8vo. 16s. net

**. Complete Catalogue of Publications post free on application.

London: H. K. LEWIS & CO. Ltd., 136 Gower Street, W.C.1

Publishing and Wholesale: 28 GOWER PLACE, W.C.1

J. & A. CHURCHILL'S NEW BOOKS

THE HEALTH OF THE INDUSTRIAL WORKER.

By EDGAR L. COLLIS, M.D., and MAJOR GREENWOOD, M.R.C.P.
A chapter on "Reclamation of the Disabled", described by A. J. COLLIS, M.D., Med. Supt., Ministry of Pensions Hospital, Leicester. Introduction by SIR GEORGE NEWMAN, K.C.B., D.C.L., M.D., F.R.C.P. Dedicated to The Rt. Hon. CHRISTOPHER ADDISON, M.D., F.R.C.S., M.P., Minister of Health.
38 Illustrations. 30s. net, postage 1s.

MENNELL'S MASSAGE: Its Principles and Practice.

2nd Edition. With 167 Illustrations. 21s. net, postage 1s.

ELECTRO-THERAPY: Its Rationale and Indications.

By J. CURTIS WEBB, M.A., M.B., B.C. Cantab.
With 6 diagrams. 5s. net, postage 3d.

A SHORT PRACTICE OF MIDWIFERY.

By HENRY JELLETT, M.D., late Master Rotunda Hospital, Dublin.
8th Edition. 4 Col. Plates, 207 Text-figures. 18s. net, postage 8d.

PHYSICAL SIGNS IN THE CHEST and ABDOMEN.

By A. J. JEX-BLAKE, M.D., F.R.C.P., Phys. to St. George's Hosp.
With 27 Illustrations. 9s. 6d. net, postage 4d.

THE PRINCIPLES OF PREVENTIVE MEDICINE.

By R. T. HEWLETT, M.D., Prof. of Bact. Univ. of Lond., and A. T. NANKIVELL, M.D., M.O.H., and School Medical Officer of Poole.
With 12 Charts and 5 Diagrams in the Text. 21s. net, postage 1s.

KLEEN'S MASSAGE AND MEDICAL GYMNASTICS.

Translated by MINA L. DOBBIE, M.D., B.Ch., Medical Officer, Chelsea Phys. Training Coll.

"The book will be found a most valuable contribution to physio-therapeutical literature. It is admirably produced."—THE LANCET.

2nd Edition. With 182 Illustrations. 32s. net, postage 1s.

GOODHART & STILL'S DISEASES OF CHILDREN.

11th Edition. With 60 Illustrations. 32s. net, postage 1s.

THE PRINCIPLES OF ANATOMY AS SEEN IN THE HAND.

By FREDERICK WOOD JONES, D.Sc., M.B., B.Sc.Lond., Professor of Anatomy in the University of Adelaide.

"Prof. Wood Jones has placed to his credit one of the most notable contributions ever made to the literature of British Anatomy. . . . It should place him in the first ranks."—BRITISH MEDICAL JOURNAL.

With 125 Illustrations. 15s. net, postage 7d.

EDEN AND LOCKYER'S GYNÆCOLOGY.

"In every way the new edition maintains the high standard of its predecessor, and it will continue to rank as probably the most satisfactory all-round text-book of moderate size on the subject published in this country."—BRITISH MEDICAL JOURNAL.

2nd Edition. 24 Col. Plates and 513 Text-figures. 42s. net, postage 1s. 3d.

STARLING'S PRINCIPLES OF PHYSIOLOGY.

"A monument to the masterly presentment of the subject by one of the most eminent of British Physiologists."—PHYSIOLOGICAL ABSTRACTS.

3rd Edition. With 579 Illustrations. 25s. net, postage 1s.

LONDON: 7 GREAT MARLBOROUGH ST., W.1

J. & A. CHURCHILL'S NEW BOOKS

SURGERY: A Text-book by Various Authors.

Edited by GEORGE E. GASK, C.M.G., D.S.O., F.R.C.S., and HAROLD W. WILSON, M.S., M.B.Lond., F.R.C.S.

With 39 Plates, 20 in colour, and 467 Text-figures. With New Methods due to War. Full of New Illustrations. £2 2s. net, postage 1s. 3d.

SURGICAL PATHOLOGY.

By SIR ANTHONY BOWLBY, K.C.M.G., F.R.C.S., and SIR F. W. ANDREWES, M.D., F.R.C.P., F.R.S.

7th Edition. With 200 New Illustrations. 30s. net, postage 1s.

MATERIA MEDICA, PHARMACY, PHARMACOLOGY AND THERAPEUTICS.

By SIR WILLIAM HALE-WHITE, K.B.E.

17th Edition. 10s. 6d. net, postage 5d.

ANATOMY OF THE HUMAN SKELETON.

By J. ERNEST FRAZER, F.R.C.S.

"We may say at once that we consider the underlying principle of the book is sound and commendable, and that the author has succeeded admirably in his aim."—BRITISH MEDICAL JOURNAL.

2nd Edition. With 219 Illustrations, many in Colour. 36s. net, post. 1s. 3d.

BERKELEY & BONNEY'S DIFFICULT OBSTETRICS.

3rd Edition. With 309 Illustrations.

42s. net, postage 1s.

TAYLOR'S MEDICAL JURISPRUDENCE.

Edited by FRED. J. SMITH, M.D., F.R.C.P.

"For the lawyer as well as the Medical Practitioner this standard work is invaluable. In every branch of law into which medical considerations enter it may always be consulted with profit."—THE JUSTICE OF THE PEACE.

7th Edition. With 20 Engravings. 2 Vols. £3 3s. net, postage 1s. 3d.

STUDENTS' SYNOPSIS SERIES.

A SYNOPSIS OF DENTISTRY.

By A. B. G. UNDERWOOD, M.B., B.S.(Lond.), M.R.C.S., L.R.C.P., L.D.S., Dent. Surg. and Lect. Dent. Anat. and Physiol. Univ. Coll. Hosp. Dental Dept.

With 10 Illustrations. 9s. 6d. net, postage, 3d.

A SYNOPSIS OF PHARMACOLOGY.

By D. COW, M.D., Exam. in Pharm. Univ. of Cambridge.

With 16 Illustrations. 7s. 6d. net, postage 3d.

A SYNOPSIS OF HYGIENE.

By W. W. JAMESON, M.D., M.O.H. Finchley, and F. T. MARCHANT, M.R.San.I., Asst. in Dept. of Hygiene, Univ. Coll., London.

With 18 Illustrations. 18s. net, postage 7d.

A SYNOPSIS OF PHYSIOLOGY.

By F. ROBERTS, M.D., Fellow and Lecturer in Phys. Clare Coll. Cam.

With 73 Illustrations. 15s. net, postage 4d.

A SYNOPSIS OF SURGERY.

By IVOR BACK, F.R.C.S., Surgeon St. George's Hosp., and A. TUDOR EDWARDS, F.R.C.S., Resident Asst. Surg. Westminster Hosp.

15s. net, postage 6d.

LONDON: 7, GREAT MARLBOROUGH ST., W.1

Edinburgh Medical Series.

TEXT-BOOKS FOR STUDENTS AND PRACTITIONERS.

GENERAL PRACTICE & X-RAYS

By ALICE VALE KNOX, M.B., B.Ch. With Chapters on Instrumentation by ROBERT KNOX, M.D., C.M., M.R.C.S., L.R.C.P. Containing 32 full-page Plates, and 56 Illustrations in the text. Probable price 15s. net

MEDICAL APPLIED ANATOMY

By T. B. JOHNSON, M.B. Containing 116 Illustrations and 3 full-page Plates in colour. Price 12s. 6d. net

DISEASES OF CHILDREN.

By DINGWALL-FORDYCE, M.D., F.R.C.P.E. Second Edition. Containing 33 full-page Plates (8 of them in colour) and 84 Illustrations in the text. Price 12s. 6d. net

A TEXT-BOOK of MIDWIFERY

By R. W. JOHNSTONE, M.A., M.D., F.R.C.S.E., M.R.C.P.E. Third Edition, containing 264 Illustrations (4 in colour). Price 12s. 6d. net

THE LAWS OF HEALTH FOR SCHOOLS.

By A. M. MALCOLMSON, M.D. Containing 33 Illustrations. Price 2s.

DISEASES AND INJURIES OF THE EYE.

By WILLIAM GEORGE SYM, M.D., F.R.C.S.E. Containing 25 full-page Illustrations (15 in colour). Price 12s. 6d. net

RADIOGRAPHY, AND RADIOTHERAPEUTICS.

By ROBERT KNOX, M.D. Edin., M.R.C.S. Eng., L.R.C.P. Third Ed. Containing 93 full-page Plates (14 in colour) and 437 Illustrations in the text.

Vol. I.—Radiography Price 35s. net

„ II.—Radiotherapeutics 18s. net

PRACTICAL PATHOLOGY, MORBID ANATOMY, AND POST-MORTEM TECHNIQUE.

By JAMES MILLER, M.D., F.R.C.P.E. Containing 111 Illustrations and a Frontispiece in colour. Price 12s. 6d. net

TUBERCULOSIS OF BONES and JOINTS IN CHILDREN.

By JOHN FRASER, M.D., F.R.C.S. Edin., Ch.M. Containing 51 full-page Plates (2 in colour) and 161 Figures in the text. Price 20s. net

THE STRUCTURE of the FOWL

By O. CHARNOCK BRADLEY, M.D., D.Sc., M.R.C.V.S. Containing 73 Illustrations. Price 6s. net

OTHER MEDICAL BOOKS.

A MANUAL OF MEDICAL JURISPRUDENCE and TOXICOLOGY.

By W. G. AITCHISON ROBERTSON, M.D., D.Sc., F.R.C.P.E., F.R.S.E. Fourth Edition, containing 26 Illustrations in the text, and a Frontispiece in colour. Price 12s. 6d. net

A MANUAL of PUBLIC HEALTH

By W. G. AITCHISON ROBERTSON, M.D., D.Sc., F.R.C.P.E., F.R.S.E. Fourth Edition containing 25 Illustrations in the text. Price 10s. 6d. net

SURGERY AT A CASUALTY CLEARING STATION.

By CUTHBERT WALLACE, C.M.G., F.R.C.S.; and JOHN FRASER, M.C., Ch.M., M.D., F.R.C.S.E. Crown 8vo. With many Illustrations. Price 10s. 6d. net

CEREBRO-SPINAL FEVER.

The Etiology, Symptomatology, Diagnosis and Treatment of Epidemic Cerebro-Spinal Meningitis. By GECIL WORTERDROUGHT, B.A., M.B., Captain (Temp.) R.A.M.C., and ALEX. MILLS KENNEDY, M.D., late Captain R.A.M.C. Demy 8vo. with 8 full-page Plates and 56 line Illustrations and charts in the text. Price 30s. net

THE POCKET PRESCRIBER.

By JAMES BURNET, M.A., M.D., M.R.C.P.E. Third Edition. Price 1s. 6d. net

THE POCKET CLINICAL GUIDE

By JAMES BURNET, M.A., M.D., M.R.C.P.E. Third Edition. Price 2s. net

MEDICAL HISTORY MANUALS

Large crown 8vo. each with 8 page Illusts.

PASTEUR AND AFTER PASTEUR.

By Stephen Paget, F.R.C.S. 5s. net

THE EDINBURGH SCHOOL OF SURGERY BEFORE LISTER.

By Alex. Miles, M.D., F.R.C.S. 5s. net

MEDIEVAL MEDICINE.

By James J. Walsh, M.D., K.C.St.G., Sc.D., Litt.D. Price 7s. 6d. net

THE EARLY HISTORY OF SURGERY IN BRITAIN.

By G. Parker, M.A., M.D., M.R.C.S. Price 7s. 6d. net

A. & C. BLACK, LTD., 4, 5 & 6, Soho Square, London, W.1.

BALE'S MEDICAL BOOKS

MALARIA AT HOME AND ABROAD. By Lieut.-Col. S. P. JAMES, M.D., D.P.H., I.M.S. (retired), Adviser on Malaria to the Ministry of Health, and a Medical Officer of the Ministry. With 1 Coloured Map, and 104 Full Page and Text Figures. Crown 4to. 25s. net, postage 1s.

ESSENTIALS OF TROPICAL MEDICINE. By W. E. MASTERS, M.D., M.R.C.S., L.R.C.P. With 9 Full Page Coloured Plates and about 400 Illustrations in the Text. Royal 8vo. £2 2s. net, postage 1s. 3d.

TROPICAL MEDICINE & HYGIENE. By C. W. DANIELS, M.B., F.R.C.P. In three parts. Demy 8vo, limp cloth. 8s. 6d., net each, postage 9d. each.

LABORATORY STUDIES IN TROPICAL MEDICINE. By C. W. DANIELS, M.B., F.R.C.P., and H. B. G. NEWMAN, C.M.G., M.D., M.R.C.P. Fourth Edition, thoroughly revised, with many new and additional Illustrations. Demy 8vo. 21s. net, postage 1s. 3d.

GONOCOCCAL INFECTION IN THE MALE. For Students and Practitioners. By NORMAN LUMB, O.B.E., M.B., B.S. With 165 Figures and 13 Three-coloured Plates. Demy 8vo. 25s. net, postage 1s.

White & Brown's Atlas of the PRIMARY AND CUTANEOUS LESIONS OF ACQUIRED SYPHILIS IN THE MALE. Intro. by Lieut.-Gen. Sir JOHN GOODWIN, K.C.B., C.M.G., Dir.-Gen. A.M.S. With 4 Coloured Lithograph Plates and 31 Plates on art paper. Demy 4to. Cloth. 27s. 6d. net; half bound in leather, 31s. 6d. net, post, 1s.

Delafield & Prudden's TEXT-BOOK OF PATHOLOGY. With a Final Section on Post-Mortem Examinations, and the Methods of Preserving and Examining Diseased Tissues. Eleventh Edition revised by FRANCIS CARTER WOOD, M.D. With 15 Full Page Plates and 809 Illustrations in the Text, in Black and Colours. Super Royal 8vo. 63s. net, postage 1s. 3d.

MILITARY SANITATION. A Handbook for Soldiers. By Col. R. J. BLACKHAM, C.B., C.M.G., C.I.E., D.S.O., M.D., D.P.H., A.M.S., of the Middle Temple, Barrister-at-Law. With Frontispiece, Map, and 20 Figures. Demy 8vo. Third Edition, Revised and largely Re-written. 10s. 6d. net, postage 9d.

AIR SICKNESS: Its Nature and Treatment. By Profs. CRUCHET and MOULINIER. Introduction by Wing-Commr. MARTIN FLACK, C.B.E., M.B. Crown 8vo. Limp Cloth. 5s. net, postage 4d.

This book contains a Chapter on Fatigue, and interesting Diagrams recording observations made before, during, and after various Swedish and Gymnastic Exercises, and before and after a Rugby Football Championship Final; showing the effects of non-training, training, and overtraining.

THE INDUSTRIAL CLINIC. A Handbook dealing with Health in Work. Edited by Prof. EDGAR L. COLLIS, M.D., M.R.C.P., Talbot Professor of Preventive Medicine in the University of Wales. With 9 Full Page Illustrations. Demy 8vo. 10s. 6d. net, postage 9d. [Modern Clinic Manuals.

THE DOCTOR'S MANUAL OR PRACTITIONER'S VADE MECUM. With which is incorporated "HOW TO CUT THE DRUG BILL." By A. HERBERT HART, M.D., M.S., Clinical Assistant to the London Hospital Venereal Clinic. Fourth or Post-Bellum Edition. Large Post 8vo. 10s. 6d. net, postage 9d.

SYNOPTIC CHART OF CARDIAC EXAMINATION. 17in. by 9in. With Explanatory 16 pp. Pamphlet. Arranged by JOHN D. COMRIE, M.D., F.R.C.P.E. 4s. 6d. net, postage 9d. [New and Revised Edition.

RURAL WATER SUPPLIES, and their Purification. By Sir ALEXANDER CRUIKSHANK HOUSTON, K.B.E., C.V.O., D.Sc., M.B. Illus. Demy 8vo. 7s. 6d. net, postage 1s.

BY THE SAME AUTHOR.

RIVERS AS SOURCES OF WATER SUPPLY. Crown 4to. 5s. net, postage 9d.

JOHN BALE, SONS & DANIELSSON, LTD.,
83-91, Great Titchfield Street, London, W.1

SELECTION FROM

CASSELL'S MEDICAL WORKS*Under the General Editorship of SIR MALCOLM MORRIS, K.C.V.O.***Manson's TROPICAL DISEASES**
(MANSON-BAHR) - - 25/- net**The ASSESSMENT OF PHYSICAL
FITNESS**, with Tables (Prof.
DREYER & G. F. HANSON)
10/- net**DIATHERMY IN MEDICAL AND
SURGICAL PRACTICE** (SABER-
TON) - - - 7/6 net**ELECTRICAL TREATMENT** (WIL-
FRED HARRIS) - - 10/6 net**DISEASES OF THE NOSE AND
THROAT**, comprising Affections
of the Trachea and Œsophagus
(SIR ST CLAIR THOMSON) 30/- net**DISEASES OF THE SKIN**
(SIR MALCOLM MORRIS) 12/6 net**THE ELEMENTS OF SURGICAL
DIAGNOSIS** (SIR ALFRED PEARCE
GOULD & ERIC PEARCE GOULD)
12/6 net**THE OPEN-AIR TREATMENT OF
PULMONARY TUBERCULOSIS**
(BURTON-FANNING) - 5/- net**A TEXTBOOK OF GYNÆCOLOG-
ICAL SURGERY** (BERKELEY &
BONNEY) - - - 42/- net**HERMAN'S DIFFICULT LABOUR**
(CARLTON OLDFIELD) 16/- net**THE STUDENT'S HANDBOOK
OF GYNÆCOLOGY** (HERMAN &
MAXWELL) - - - 10/- net**PULMONARY TUBERCULOSIS
IN GENERAL PRACTICE**
(HALLIDAY G. SUTHERLAND)
10/6 net**MATERIA MEDICA** (BRUCE AND
DILLING) - - - 9/- net**TUMOURS, INNOCENT AND
MALIGNANT** (SIR JOHN BLAND-
SUTTON) - - - 21/- net**A MANUAL OF CHEMISTRY**
(LUFF & CANDY) - 12/6 net**A MANUAL OF PHYSICS**
(CANDY) - - - 7/6 net**CLINICAL METHODS** (HUTCHISON
and RAINY) - - - 12/6 net**THE STUDENT'S HANDBOOK
OF SURGICAL OPERATIONS**
(TREVES & HUTCHINSON) 9/- net**SURGICAL APPLIED ANATOMY**
(TREVES, KEITH, & MACKENZIE)
12/- net**HYGIENE AND PUBLIC HEALTH**
(SIR A. WHITELEGGE and SIR G.
NEWMAN) - - - 10/6 net**SERUMS, VACCINES, & TOXINS**
In Treatment and Diagnosis
(BOSANQUET and EYRE) 9/- net**A MANUAL of MEDICAL TREAT-
MENT** (BURNES YEO. Fifth
Edition, by CRAWFORD & BUZ-
ZARD) - - - 30/- net**RADIUM THERAPY** (WICKHAM &
DEGRAIS) - - - 15/- net**THE DIAGNOSIS OF SMALLPOX**
(RICKETTS & BYLES) - 16/- net**A HANDBOOK of MIDWIFERY:**
for Midwives, Maternity Nurses,
and Obstetric Dressers (COMYNS
BERKELEY) - - - 7/6 net

Complete List of Medical Works, post free, on application.

CASSELL & COMPANY LIMITED, LA BELLE SAUVAGE, LONDON, E.C.

MACMILLAN'S LIST.

GREEK MEDICINE IN ROME: The Fitzpatrick Lectures on the History of Medicine delivered at the Royal College of Physicians of London in 1909-10. WITH OTHER HISTORICAL E.SAYS. By the Right Hon. Sir Clifford Allbutt, K.C.B., M.D., F.R.S. 8vo.

DISEASES of the ARTERIES Including Angina Pectoris.

By SIR CLIFFORD ALLBUTT, K.C.B., M.D., F.R.S. In 2 vols. 8vo. 30s. net.
"The perusal of a work such as this is indeed a delight to the clinical reader. Careful observation, checked by critical acumen, reasonable deduction tempered by common sense, and well-balanced conclusions enunciated after judicial summary, are the distinguishing features of the methods adopted throughout this important work. . . . The profession is the richer by a comprehensive clinical treatise which will doubtless take its place among the medical classics of its day as the *magnum opus* of a great clinical philosopher."—BRITISH MEDICAL JOURNAL.

FIBROIDS AND ALLIED TUMOURS (Myoma and Adenomyoma): Their Pathology, Clinical Features, and Surgical Treatment.

Editor of "The New System of Gynaecology." With an Introductory Notice by ALBAN DORAN, F.R.C.S., Consulting Surgeon to the Samaritan Free Hospital for Women. With 316 Illustrations, including 37 Coloured Plates. Super Royal 8vo. 63s. net.
"It is a mine of information which will reward the attention of all gynaecologists, particularly those engaged in teaching. It may be commended to all interested in the subject as a masterly and exhaustive exposition, clearly and interestingly written, and profusely, beautifully, and instructively illustrated."—BRITISH MEDICAL JOURNAL.

THE NEW SYSTEM OF GYNÆCOLOGY.

Edited by THOMAS WATTS EDEN, M.D., F.R.C.S.E., F.R.C.P., and CUTHBERT LOCKYER, M.D., B.S., F.R.C.P., F.R.C.S. In 3 Vols. With numerous illustrations in Colour and Black and White. Crown 8vo. £6 6s. net.
"The New System of Gynaecology" is highly creditable to British gynaecology. The printing, paper, and illustrations are admirable. . . . We have no hesitation in stating that it is the best work on gynaecology published up to the present time."—BRITISH MEDICAL JOURNAL.

DEFORMITIES, including DISEASES of the BONES and JOINTS. By A. H. TUBBY, M.S., Lond., F.R.C.S. Eng., Second Edition (1912) Illustrated. 2 Vols. 8vo. 48s. net.

1st Edition.—"Standard work on the subject in the English language."—BRITISH MEDICAL JOURNAL.
2nd Edition.—"Worthy of the reputation of the author and of British Orthopaedic Surgery."—BRITISH MEDICAL JOURNAL. "The English classic on the subject dealt with."—MEDICAL TIMES. "Most complete and authoritative exposition of the subjects with which it deals."—EDINBURGH MEDICAL JOURNAL.

Modern Methods in the SURGERY of PARALYSES.

By A. H. TUBBY, M.S. Lond., F.R.C.S., and SIR ROBERT JONES, K.C.B., F.R.C.S.E. Illustrated. 10s. net. "The work maintains the high standard of excellence with which we always associate Mr. Tubby's name."—GUY'S HOSPITAL GAZETTE.

HUMAN PHYSIOLOGY. By Prof. LUIGI LUCIANI. With a Preface by Prof. J. N. Langley, F.R.S. Illustrated.

In 5 Vols. 8vo. 21s. net each. Vol. V.—METABOLISM—TEMPERATURE—REPRODUCTION, ETC. Edited by M. S. PEMBREY, M.D., Lecturer in Physiology, Guy's Hospital. [Completing the work.] Previously published:—Vol. I.—CIRCULATION AND RESPIRATION. Vol. II.—INTERNAL SECRETION—DIGESTION—EXCRETION—THE SKIN. Vol. III.—MUSCULAR AND NERVOUS SYSTEMS. Edited by GORDON M. HOLMES, M.D. Vol. IV.—THE SENSE ORGANS. Edited by GORDON M. HOLMES, M.D.

ZOOLOGY FOR MEDICAL STUDENTS.

By J. GRAHAM KERR, F.R.S., Regius Professor of Zoology in the University of Glasgow. Illustrated. 8vo.

THE JOURNAL OF INDUSTRIAL HYGIENE.

Editors: Great Britain—A. F. STANLEY KENT, A.M., D.Sc. United States—DAVID L. EDSELL, M.D., D.D. Monthly. Annual subscription, 20s. net. Single copies, 4s. net.

MACMILLAN & CO. LTD., LONDON, W.C.2.

THACKER, SPINK & CO.'S PUBLICATIONS.

Thick Royal 8vo, Cloth. Rs. 20.

MEDICAL JURISPRUDENCE FOR

INDIA (Lyon's). With about 300 Illustrative Cases. By L. A. WADDELL, C.B., C.I.E., LL.D., M.B., F.L.S., Lt.-Col. I.M.S. (retired). Seventh Edition. With numerous illustrations.

Fifth Edition. Crown 8vo, Cloth. Rs. 6.

HINTS for the Management and Medical

Treatment of CHILDREN IN INDIA (BIRCH'S). Fifth Edition. By C. R. M. GREEN, M.D., Lieut.-Col. I.M.S.

Second Edition. Crown 8vo, Cloth. Rs. 4.

Handbook for WIVES and MOTHERS

IN INDIA AND THE TROPICS. By Miss M. E. STALEY, M.B., Late Physician in Charge of Lady Aitchison Hospital, Lahore.

Cloth. 179 pages interleaved. Rs. 3.8.

PRACTICAL BAZAAR MEDICINES.

With over 200 useful Prescriptions. By G. T. BIRDWOOD, M.A., M.D., Lieut.-Colonel, I.M.S.

Second Edition. 12mo, Cloth. Rs. 7.8.

CLINICAL METHODS FOR INDIAN

STUDENTS. A Guide in Diagnostic and Therapeutic Measures. By G. T. BIRDWOOD, M.A., M.D., Lieut.-Col. I.M.S.

Crown 8vo, Cloth. Rs. '5.

STUDIES IN MALARIA.

By H. STOTT, Capt. I.M.S., M.R.C.S. Eng., Surgeon to H.E. the Governor of Madras. With Charts and Diagrams.

Fourth Edition. Medium 8vo, Cloth. Rs. 3.8.

TROPICAL HYGIENE.

For Residents in Tropical and Sub-Tropical Climates. Text-Book of the Indian Branch of the St. John Ambulance Association. By the Hon. Sir C. P. LUKIS, M.D., M.R.C.S., K.C.S.I., V.O., Surgeon-General I.M.S., and R. J. BLACKHAM, C.I.E., Col. R.A.M.C.

Subscription, Rs. 16. Yearly, Including Foreign Postage.

INDIAN MEDICAL GAZETTE.

A Monthly Record of Medicine, Surgery, Public Health, and Medical News, Indian and European. The Organ of the Indian Medical Service. Edited by D. McCAY, M.D., M.R.C.P. (London), Lt.-Col., I.M.S.

**A comprehensive Catalogue of Medical Books
sent free upon application.**

CALCUTTA: THACKER, SPINK & CO.

LONDON Agents: W. THACKER & CO., 2 CREED LANE, E.C.

HENRY KIMPTON'S PUBLICATIONS

CLINICAL SURGERY BY CASE HISTORIES

By ARTHUR E. HERTZLER, M.D., F.A.C.S.

In two royal octavo volumes of 1162 pages, with 483 original illustrations. Cloth.
Price £5 net (postage 1/6).

Fourth Edition.

Now Ready.

GENITO-URINARY DISEASES AND SYPHILIS

By HENRY H. MORTON, M.D., F.A.C.S.
Fourth edition, revised and enlarged.
Royal 8vo, 807 pages, with 330 Illustrations and 36 Coloured Plates. Cloth.
Price 42/- net (postage 1/3).

Third Edition.

Now Ready.

DISEASES OF THE SKIN

By RICHARD L. SUTTON, M.D.

Third Edition, revised and enlarged.
Royal 8vo, 1084 pages, with 910 Illustrations and 11 Coloured Plates.
Price 50/- net (postage 1/6).

New (Second) Edition.

Just Ready.

OPERATIVE GYNECOLOGY

By HARRY STURGEON CROSSEN, M.D., F.A.C.S. Second edition, revised and enlarged. Royal 8vo, 717 pages, with 834 original illustrations. Cloth.
Price 63/- net (postage 1/3).

TEXT-BOOK OF UROLOGY in Men, Women and Children Including Urinary and Sexual Infections, Urethroscopy and Cystoscopy.

By VICTOR C. PEDERSEN, M.D., F.A.C.S.
Royal 8vo, 991 pages, with 312 Illustrations and 13 Coloured Plates. Cloth.
Price 42/- net (postage 1/3).

THE FUNDAMENTALS OF HUMAN ANATOMY

Including its Borderland Districts.

From the View-point of a Practitioner.

By MARSH FITZMAN, M.D.

Royal 8vo, 356 pages, with 101 Illustrations. Cloth.

Price 24/- net (postage 9d.).

Third Edition.

Just Ready.

PHYSIOLOGY AND BIOCHEMISTRY IN MODERN MEDICINE

By J. J. R. MACLEOD, M.B., Ch.B., D.P.H., *Professor of Physiology in the University of Toronto*, assisted by Mrs. ROY G. PEARCE, A.C. REDFIELD, and N.B. TAYLOR, and by others.
Third edition, revised and enlarged. Royal 8vo, 1024 pages, with 243 Illustrations, including Half-tones, Line Drawings, Charts, and 9 Plates in Colours. Cloth.
Price 42/- net (postage 1/3).

TEXT-BOOK OF RADIOLOGY (X-RAYS)

By E. R. MORTON, M.D., F.R.C.S.
Second edition, enlarged and revised.
Demio 8vo, 280 pages, with 93 Illustrations and 36 full-page Plates. Cloth.
Price 10 6 net (postage 9d.).

PSYCHOPATHOLOGY

By EDWARD J. KEMPF, M.D.

Large 8vo, 702 pages, with 87 Illustrations. Cloth.

Price 63/- net (postage 1/6).

Eighth Edition.

Just Ready.

SYMPTOMS IN THE DIAGNOSIS OF DISEASE

By HOBART A. HARE, M.D., B.Sc. Eighth edition, thoroughly revised. Royal 8vo, 562 pages, with 195 Engravings and 9 Plates. Cloth. Price 36/- net (postage 1/-).

THE AFTER-TREATMENT OF SURGICAL PATIENTS

By WILLARD BARTLETT, M.D., F.A.C.S., AND COLLABORATORS. Two Royal 8vo volumes of 1038 pages, with 431 Illustrations and one Plate. Cloth.
Price 60/- net (postage 1/6).

New Catalogue post free upon request.

HENRY KIMPTON, 263 High Holborn, LONDON, W.C.1. Eng.

Wright, Publishers, Bristol

Large 8vo. Richly Illustrated by Original Drawings in Colour and Black and White. 21/- net. Postage 9d.

GUNSHOT INJURIES to the BLOOD-VESSELS.

Founded on experience gained in France during the Great War, 1914—1918.

By SIR GEORGE H. MAKINS. G.C.M.G., C.B., F.R.C.S.,

President Royal College of Surgeons, England; Surgeon St. Thomas's Hospital; Honorary Major-General, and late Senior Consulting Surgeon to the B.E. Force.

"The book is instructive and of great value for reference. The whole work will doubtless be the foundation of the text-book articles on the subject for years to come."—*Brit. Med. Jour.*

"The work must be regarded as a 'classic' on the subject, and it will take its place as a contribution to the literature of military surgery equal in value to that of the author's surgical experiences in South Africa. . . . A word of praise is due to the publishers; the coloured plates and the reproduction of the figures in the text are exceptionally good."—*Med. Press and Circular.*

Eighth Edition, Fully Revised. With additional Matter, 362 Illustrations, of which many are new or redrawn, and 11 Plates. 21/- net. Postage 1/-.

Pye's Surgical Handicraft.

A Manual of Surgical Manipulations, Minor Surgery, and other matters connected with the work of House Surgeons, Surgical Dressers, etc.

EDITED AND LARGELY RE-WRITTEN

By W. H. CLAYTON-GREENE, C.B.E., B.A., M.B., C.M., F.R.C.S.,
Surg. to St. Mary's Hosp.; Lect. on Surg. in the Med. School, etc.

With special chapters concerning

Anæsthesia: by JOS. BLOMFIELD, M.D.

The Ear, Nose, Throat, Larynx, and Head Injuries: by H. W. CARSON, F.R.C.S.

The Eye: by LESLIE PATON, B.A., F.R.C.S.

The Treatment of the Teeth: by NORMAN BENNETT, M.A., L.D.S., M.R.C.S. Eng.

Poisoning and Urine Testing: by WM. HENRY WILLCOX, C.M.G., B.Sc., M.D.

X-Rays and the Taking of Skiagrams: by GEO. HARRISON ORTON, M.A., M.D.

Recent Advances in Diagnosis & Treatment of Syphilis: by A. FLEMING, F.R.C.S.

"A new and revised eighth edition of this useful manual has just been published . . . the letterpress is full of information invaluable to the student, the house surgeon, and the general practitioner. The book is exceedingly well got up."—*Lancet.*

Demj 8vo. With 136 Illustrations. 7/6 net. Postage 9d.

Modern Methods of Treating Fractures.

By ERNEST W. HEY GROVES, M.S., M.D., B.Sc., F.R.C.S.,

Surgeon Bristol General Hospital; Consulting Surgeon Cosham Hospital; Late Hunterian Professor Royal College of Surgeons, England; Examiner in Surgery, University of London.

"Among the virtues of the book, particular attention must be drawn to its conciseness. This has not been attained at the expense of completeness of treatment. It evidently results from clear, vivid thought, from good arrangement of material, and from a desire to say what has to be said, clearly and briefly."—*Brit. Jour. of Surgery.*

"The illustrations and pathological conditions of bones are very good, and so are the models of surgical appliances for operative procedures."—*British Medical Journal.*

Bristol: John Wright & Sons Ltd. London: Simpkin & Co. Ltd.



—WM. HEINEMANN—

(MEDICAL BOOKS) Ltd.



IMPORTANT NEW BOOKS.

GENERAL PATHOLOGY and SPECIAL PATHOLOGY.

By J. MARTIN BEATTIE, M.A. (N.Z.), M.D. Edin., and
W. E. CARNEGIE DICKSON, M.D., B.Sc., F.R.C.P. Edin.
New Edition, in two volumes. Royal 8vo. 31s. 6d. net each.
Inland postage, 1s.

VENEREAL DISEASES : their Clinical Aspect and Treatment.

With an Atlas of 106 Colour and 21 Half-tone Illustrations.
By J. E. R. McDONAGH, F.R.C.S., Surgeon, London Lock
Hospital; late Hunterian Professor, Royal College of Surgeons.
Crown 4to. £3 3s. net. Inland postage, 1s. 3d.

PREVENTION OF VENEREAL DISEASE.

By Sir ARCHDALL REID, K.B.E. With an Introduction by
Sir BRYAN DONKIN, M.D. Crown 8vo. 15s. net. Inland
postage, 9d.

DISEASES OF THE THROAT, NOSE, AND EAR.

By DAN MCKENZIE, M.D., F.R.C.S.E. With numerous
Illustrations and Coloured Plates. Royal 8vo. £2 2s. net.
Inland postage, 1s.

GOUT : Its Etiology, Pathology, Course, and Treatment.

By LLEWELLYN JONES LLEWELLYN, M.B. Lond., Co-
author of "Fibrositis", "Malingering", and "Pensions". With
a Section on Ocular Disease in the Gouty, by W. M. BEAU-
MONT, M.R.C.S. Royal 8vo. 30s. net. Inland postage, 1s.

DIATHERMY: Its Production and Uses in Medicine and Surgery.

By ELKIN PERCY CUMBERBATCH, M.A., B.M. Oxon.,
M.R.C.P., Medical Officer in Charge Electrical Department, St.
Bartholomew's Hospital, etc. Demy 8vo, Illustrated. 21s. net.
Inland postage, 9d.

ATLAS OF NORMAL LABOUR.

Showing the complete Process from the first Dilatation of the
Os Uteri to the Expulsion of the Placenta in both vertex and
breech cases. By G. DRUMMOND ROBINSON, M.D.,
F.R.C.P. Produced from Motion Pictures and Animated Dia-
grams. Crown 4to. Over 400 Illustrations. 25s. net. Inland
postage, 9d.

SELECTED LECTURES AND ESSAYS

(Including a New Edition of the Nature of Ligaments). By
Sir JOHN BLAND-SUTTON, F.R.C.S. Eng. Demy 8vo.
Illustrated. 15s. net. Inland postage, 9d.

Medical Catalogue Free on application to—

20 BEDFORD STREET, LONDON, W.C. 2



Wright, Publishers, Bristol

4th Edition. Fully revised and largely re-written. Crown 8vo. 300 pp. With Coloured Frontispiece. Cloth 9/6 net; Paper 7/6 net. Postage 6d.

The NEW PHYSIOLOGY

In Surgical and General Practice.

By A. RENDLE SHORT, M.D., B.S., B.Sc. Lond., F.R.C.S. Eng.,
*Examiner in Physiology for the F.R.C.S.; Late Hunterian Prof. Royal Coll. of Surgeons;
 Senior Assist. Surgeon, Bristol Royal Infirmary; Lect. on Physiology, Univ. of Bristol.*

"The fourth edition consists of a series of fourteen essays attractively written. . . . The subjects dealt with are all of daily recurrence in the public or the medical press, and the author is to be congratulated upon the skill and completeness with which he gives a scientific presentment of them in terms easily comprehensible. . . . The book may be cordially recommended to all readers wishing to keep abreast of recent progress in physiology."—*Brit. Med. Jour.*

"Great as was the value of the book at its first issue, it is now indispensable to the practitioner who wishes to keep himself versed in the rapidly augmenting area of physiological knowledge ready to be applied in medicine."—*Lancet.*

Demy 8vo. Illustrated. Cloth 8/- net; Paper Covers, 6/- net. Postage 6d.

ELECTRIC IONIZATION:

A Practical Introduction to its Use in Medicine & Surgery.

By A. R. FRIEL, M.A., M.D. Dublin; F.R.C.S.I.,
Aural Specialist, Ministry of Pensions, London District; Late Physician Throat, Nose and Ear, General Hospital, Johannesburg; and late Aural Surgeon and Bacteriologist No. 1 South African General Hospital, B.E.F. France.

Explains what is meant by ionization, and describes how the electric current can be utilized to introduce drugs into affected parts of the body for the treatment of disease. Deals with the equipment necessary, with the effects of different ions; and the technique suitable for applying ionization to different parts of the body.

"The book is well set out and can be recommended."—*Brit. Med. Jour.*

"Can be thoroughly recommended."—*Arch. of Radiology and Electrotherapy.*

"Merits an unqualified success."—*Dr. S. Leduc.*

Now Ready. 2nd Edition. 8vo. With Coloured Plates and Illustrations.
 6/6 net. Postage 4d.

BLOOD PICTURES:

An Introduction to Clinical Hæmatology.

By CECIL PRICE-JONES, M.B. Lond., CAPT. R.A.M.C. (T.C.)
Bacteriologist, British Expeditionary Force.

"A brief but well written introduction to the clinical study of the blood . . . should be in the hands of all medical students, and will be found useful by many of their seniors."—*Brit. Med. Jour.*

"The need for an elementary clinical work on this subject has long been felt . . . the description is particularly clear and uncomplicated . . . an excellent little work."—*Med. Press and Circ.*

"Many general practitioners will welcome this little book . . . well arranged . . . agreeably dogmatic, and presents the subject in lucid form."—*Lancet.*

"Coloured plates drawn by the author . . . of exceptional excellence . . . altogether a work which is a model for accuracy and conciseness."—*Rev. of Bacteriology.*

Bristol: John Wright & Sons Ltd. London: Simpkin & Co. Ltd.

E. & S. LIVINGSTONE, PUBLISHERS,

17 Teviot Place, EDINBURGH.

BOOKS JUST PUBLISHED.

MANUAL OF OPHTHALMIC PRACTICE. By F. P. MAYNARD, M.B. (Durh.), D.P.H. (Camb.), F.R.C.S. (Eng.), Late Prof. of Ophthalm. Surg. Med. Coll. and Ophthalm. Surg. Med. Coll. Hosp., Calcutta; Surg.-Supt. Mayo Native Hosp., Calcutta; Fellow of the Calcutta Univ., etc. Royal 8vo. Cloth. 316 + xxi. pp. With 12 plates containing 60 coloured illustrations and with 131 illustrations in the text. 25s. net. Inland post. 1s.

MANUAL OF OPHTHALMIC OPERATIONS. By the same Author. 2nd Edition. Royal 8vo. Cloth. 248 + xix. pp. With 6 stereoscopic plates and 136 illustrations in the text. 21s. net. Inland post. 1s.

A POCKET BOOK OF OPHTHALMOLOGY. By ARTHUR JAC. BALLANTYNE, M.D., F.R.F.P.S. (Glas.); Lect. on Ophthalmology, Univ., Glasgow; Surg., Glasgow Eye Infirmary; Hon. Con. Ophthalm. Surg., Royal Maternity and Women's Hosp., Glasgow, etc., etc. Crown 8vo. Cloth. 120 pp. INTERLEAVED. 5s. 6d. net.

MANIC-DEPRESSIVE INSANITY & PARANOIA. Translated by R. MARY BARCLAY, M.A., M.B. Edited by Prof. G. M. ROBERTSON, M.D., F.R.C.P., Supt., Royal Asylum, Morningside. Companion Volume to "Dementia Præcox." Demy 8vo. 320 pp. With numerous illustrations, coloured and plain, from Kraepelin's "Psychiatry," Vols. III. and IV. 21s. net. Postage 1d.

ANATOMY OF THE BRAIN & SPINAL CORD. Thoroughly revised by J. RYLAND WHITTAKER, B.A., M.B. (Lond.), F.R.C.P. (Ed.), Lect. on Anatomy, School of Med., Edinburgh. 5th Edition. Crown 8vo. Cloth. 256 pp. With 103 beautifully lithographed illustrations. 12s. 6d. net. Postage 6d.

TO BE PUBLISHED DURING THE SPRING 1921.

Textbook of MEDICAL JURISPRUDENCE & TOXICOLOGY. Completely revised by Prof. JOHN GLAISTER, M.D., etc., Univ., Glasgow. 4th Edition. Demy 8vo. 1000 pp. 140 illustrations.

MANUAL OF SURGICAL ANATOMY. Thoroughly Revised by C. R. WHITTAKER, F.R.C.S.M., F.R.S.E., Senior Demonstrator of Anatomy, Surgeon's Hall, Edin. 3rd Edition. Crown 8vo. Cloth. 450 pp. With 100 illustrations, coloured and plain.

BOOKS MOST RECENTLY PUBLISHED.

HANDBOOK OF DISEASES of the NOSE, THROAT & EAR. By Wm. SMITH STARR, M.D., F.R.F.P.S. Glasgow; Lect. on Diseases of the Throat and Nose, Univ., Glasgow; Surg. for Diseases of Nose and Throat, Western Infirmary, Glasgow; Surg., Glasgow, E.U. Nose and Throat Hosp. Crown 8vo. 320 pp., 26 illustrations. 9s. 6d. net. Postage 6d.

Kraepelin's Psychiatry, Vol. III.

DEMENTIA PRÆCOX. Translated by R. MARY BARCLAY, M.A., M.B. Edited by Prof. G. M. ROBERTSON, M.D., F.R.C.P., Supt., Morningside Asylum. Demy 8vo. 328 + xii. pp. 43 illustrations. 17s. 6d. net. Postage 6d.

HANDBOOK OF DISEASES OF CHILDREN. By JAMES BURNETT, M.A., M.D., M.R.C.P. Edin., Physician for Diseases of Infancy and Childhood, and Physician in charge, Child Welfare Clinic, Marshall Street Dispensary, Edinburgh, etc., etc. 2nd Edition. Crown 8vo. 416 + viii. pp., with 8 full-page plates and other illustrations. 10s. 6d. net. Postage 6d.

HANDBOOK OF SKIN DISEASES. By FREDERICK GARDINER, D.Sc., M.D., F.R.C.S.; Lect. on Diseases of Skin, Univ. Edin.; Physician for Diseases of Skin, Royal Infirmary, Edinburgh; Cons. Dermat., Bangour Hosp., etc., etc. Crown 8vo. 160 + xx. pp. 46 illustrations. 6s. 6d. net. Postage 4d.

HANDBOOK OF ANÆSTHETICS. By J. STUART ROSS, M.B., Ch.B., F.R.C.S.E., Lect. in Practical Anæsthetics, Univ. of Edinburgh; Hon. Anæsthetist, Edinburgh Dental School; Anæsthetist, Deaconess Hosp.; Instructor in Anæsthetics, Edinburgh Royal Infirmary. With an introduction by H. ALEXIS THOMSON, M.D., F.R.C.S.E., M.D., F.R.S.E., Prof. of Surg., Univ. of Edinburgh. And Chapters upon LOCAL AND SPINAL ANÆSTHESIA, By WILLIAM QUARRY WOOD, M.D., F.R.C.S.E., Late Temp. Assist. Surg., Edinburgh Royal Infirmary. And upon INTRATRACHEAL ANÆSTHESIA, By H. TORRANCE THOMSON, M.D., F.R.C.S.E., Anæsthetist to the Leith Hosp. Crown 8vo. 211 + xii. pp. 51 illustrations. 8s. net. Postage 5d.

HALF-A-CENTURY OF SMALLPOX AND VACCINATION. By JOHN C. McVALE, M.D., LL.D. Demy 8vo. 86 + viii. pp. 5s. 6d. net. Postage 4d.

WHEELER'S HANDBOOK OF MEDICINE. By W. R. JACK, M.D., F.R.F.P.S.G., Physician, Glasgow Royal Infirmary; Lect., Clinical Medicine, Univ. of Glasgow. 6th Edition. Crown 8vo. Cloth. 568 pp. 31 illustrations. Thoroughly revised, and containing Chapters on Medical Diseases of the War. 12s. 6d. net. Postage 6d.

OTHER PUBLICATIONS.

A TEXTBOOK OF PUBLIC HEALTH. By JOHN GLAISTER, M.D., D.P.H. (Camb.), F.R.S.E., Prof. of Forensic Medicine and Public Health, Univ. of Glasgow. 2nd Edition. Demy 8vo. Cloth. 622 pp. Illustrated. 20s. net. Postage 9d.

[CATECHISM] FULL CATALOGUE SENT POST FREE ON APPLICATION. [SERIES.]

Wright, Publishers, Bristol

3rd Edition, Revised & with several New Coloured Plates. Four times reprinted. 25th Thousand. Large 8vo. 30 Coloured Plates and over 300 Illustrations, and a fully-detailed General Index containing upwards of 60,000 references. Bevelled Boards. Burnished top, £2 2s. net. Postage 1/3.

AN INDEX OF Differential Diagnosis OF MAIN SYMPTOMS.

By Various Writers.

Edited by

HERBERT FRENCH, C.B.E., M.A., M.D. Oxon., F.R.C.P. Lond.,

Physician to H.M. Household; Physician and Lecturer, Guy's Hospital; Cons. Physician to the Radium Institute.

IN CONJUNCTION WITH THE FOLLOWING CONTRIBUTORS:

<p>WILLIAM CECIL BOSANQUET, M.A., M.D. Oxon., F.R.C.P. E. FARQUHAR BUZZARD, M.A., M.D., B.Ch. Oxon., F.R.C.P. PERCY J. CAMMIDGE, M.D. Lond., D.P.H. Camb. CAREY F. COOMBS, M.D., F.R.C.P. HERBERT L. EASON, M.D., M.S. Lond. JOHN W. H. EYRE, M.D., M.S. Durh., D.P.H. Camb. HERBERT M. FLETCHER, M.A., M.D. Camb., F.R.C.P. Sir ARCHIBALD E. GARROD, K.C.M.G., M.A., M.D. Oxon., F.R.C.P., F.R.S. GEORGE ERNEST GASK, C.M.G., D.S.O., F.R.C.S. HASTINGS GILFORD, F.R.C.S. ARTHUR F. HURST, M.A., M.D. Oxon., F.R.C.P. ROBERT HUTCHISON, M.D., C.M. Edin., F.R.C.P.</p>	<p>ARTHUR J. JEX-BLAKE, M.A., M.D., B.Ch. Oxon., F.R.C.P. Sir MAICOLM MORRIS, K.C.V.O., F.R.C.S. Edin. ROBERT F. ROWLANDS, O.B.E., M.S. Lond., F.R.C.S. JAMES E. H. SAWYER, M.A., M.D., B.Ch. Oxon. FREDERICK J. SMITH, M.A., M.D. Oxon., F.R.C.P., F.R.C.S. THOMAS GEORGE STEVENS, M.D., B.S. Lond., M.R.C.P., F.R.C.S. RUSSELL, H. JOCELYN SWAN, O.B.E., M.B., M.S. Lond., F.R.C.S. Sir FREDERICK TAYLOR, Bart., M.D. Lond., F.R.C.P. PHILIP TURNER, B.Sc., M.B., M.S. Lond., F.R.C.S. Sir WM. HAILE WHITE, K.B.E., M.D. Lond., M.D. Dublin, F.R.C.P.</p>
---	---

FROM NOTE TO THE THIRD EDITION.

The early exhaustion of the second edition called for an immediate re-issue. Advantage has been taken of this fact to introduce a few more coloured figures of cases which it was found impossible to complete in time for the second edition, and to replace some of the black-and-white by better examples. The publishers are gratified that the unprecedented demand for the volume has made these improvements possible at so early a date.

"The new edition is an improvement in many ways on the old, and has been re-cast on ampler lines, with a large number of new illustrations and coloured plates. Having read most of the articles in the book, we have no hesitation in saying that it should be in the hands of all practitioners and senior students. . . . The publisher is to be congratulated upon the printing of the book and its illustrations, perhaps most of all upon the excellence of the many coloured plates; they could not be better, and do great credit to British colour printing."—*Brit. Med. Jour.*

"The first edition of this stateliy volume has been exhausted within three years. . . . The editor has added new articles, revised old ones, and nearly doubled the number of illustrations. These are not only excellently reproduced, but deal with real difficulties in diagnosis."—*Lancet.*

"Reflects the highest credit upon all concerned in its production. The most remarkable feature in the book is its full index. . . . an essential part of the scheme. . . . will be found a friend in need at all times."—*Practitioner.*

Bristol: John Wright & Sons Ltd. London: Simpkin & Co. Ltd.

♦♦♦♦♦ Wright, Publishers, Bristol ♦♦♦♦♦

Seventh Edition. 24th Thousand, Fully Revised; with additional Articles and Illustrations. Twice Reprinted. Demy 8vo. Over 1100 pp. Bevelled boards and burnished top. 30/- net. Postage 1/-.

AN INDEX OF TREATMENT.

BY EIGHTY-SEVEN REPRESENTATIVE WRITERS.

Edited by **ROBERT HUTCHISON, M.D., F.R.C.P.,**

Physician to the London Hospital;

And **JAMES SHERREN, C.B.E., F.R.C.S.**

Surgeon to the London Hospital.

**A COMPLETE GUIDE TO TREATMENT IN A FORM
CONVENIENT FOR REFERENCE.**

"We cannot do more than recommend it in terms of high laudation: it is a volume that should be in the hands of every practitioner of medicine."—*Brit. Med. Jour.*

"Since we first reviewed this book on its appearance in 1908 six further editions have been issued—a gratifying evidence of success which establishes it beyond the reach of criticism. Its general plan and high standard of excellence are doubtless well known to our readers."—*Lancet.*

"The popularity of this work still continues . . . this index is well worthy of its success, reflecting as it does the latest teaching in medical science."—*Med. Press and Circular.*

"The information offered is at once practical, concisely stated, and based on the best of modern teaching. This *Index of Treatment* will undoubtedly continue to deserve the approval of the busy general practitioner."—*Hospital.*

"It is a well-arranged work on medical and surgical matters, and should be found most useful to the busy practitioner and student alike."—*Edin. Med. Jour.*

Second Edition, Revised and Enlarged. Cloth, Bevelled Boards, Burnished Top. 30/- net. Postage 1/-.

A companion Volume to the *Index of Treatment* and the *Index of Differential Diagnosis.*

AN INDEX OF PROGNOSIS

And END-RESULTS OF TREATMENT.

BY TWENTY-FOUR REPRESENTATIVE CONTRIBUTORS.

Edited by **A. RENDLE SHORT, M.D., B.S., B.Sc. Lond., F.R.C.S. Eng.**

"The editor and his contributors are to be warmly congratulated upon the result. The articles are short and compact, clearly written, and as comprehensive as it has been practicable to make them."—*Lancet.*

"We heartily congratulate the authors on the result . . . a total absence of tediousness."—*Dublin Jour. of Med. Sci.*

"There is nothing to rival the value of this book, and probably nothing will replace it. Possibly later writers may supplement it, but none will supplant it."—*Univ. Med. Record.*

"Truly a wonderful book. . . . We do not know of any book, in any language, covering the same ground. . . . An enormous help to practitioners."—*South African Med. Rec.*

"It is a really great and able work, which should be highly esteemed, and will prove of great utility both for practitioners and hospital doctors."—*Hospitalstidende.*

SPECIAL OFFER.

**These 3 popular Volumes supplied
as a Complete Set for £4 10s. net.**

Bristol: John Wright & Sons Ltd. London: Simpkin & Co. Ltd.

Wright, Publishers, Bristol

3rd Edition. Demy 8vo. Fully revised, with a Photographic Portrait of the late Major Porter, and 79 Illustrations, 44 of which are in Colour.
12/6 net. Postage 9d.

DISEASES OF THE THROAT, NOSE AND EAR.

For Practitioners and Students.

By W. G. PORTER, M.B., B.Sc., F.R.C.S. Ed., (MAJOR R.A.)

Late Surgeon to the Eye, Ear, and Throat Infirmary, Edinburgh, etc.

Fully Revised under the Editorship of

A. LOGAN TURNER, M.D., F.R.C.S. Ed.,

Consulting Surgeon Edinburgh Eye, Ear, and Throat Infirmary, and Lecturer on Diseases of the Ear and Throat, University of Edinburgh, etc.

"The book remains a source of sound teaching of moderate dimensions for the senior student and the general practitioner."—*Lancet*.

"A very successful attempt to compress a sufficiency of information on the throat, nose, and ear into the compass of just over 300 pages of text . . . illustrations are good, index is now full and accurate, and the text singularly lucid and complete. . . . We know of no manual of its size better suited to the needs of the general practitioner."—*Brit. Med. Jour.*

"Sustains well the high opinion which we expressed in 1913. . . . One of the most complete and accurate handbooks on the subject that we possess."—*Jour. of Laryngology*.

Demy 8vo. With 592 Illustrations. 17/6 net. Postage 9d.

OTO-RHINO-LARYNGOLOGY

For the Student and Practitioner.

By Dr. GEORGES LAURENS.

AUTHORIZED ENGLISH TRANSLATION OF THE SECOND REVISED FRENCH EDITION

By H. CLAYTON FOX, F.R.C.S.,

WITH A FOREWORD CONTRIBUTED BY

J. DUNDAS GRANT, M.A., M.D., F.R.C.S.

In this work detail is carried to the last degree of refinement, and the practitioner will be surprised at the minuteness with which his every touch is described for him. The differentiation drawn between "What to do," and "What not to do," should render his proceedings essentially safe.

"The most profusely illustrated handbook that we have seen; there is hardly a page that is not illustrated by one to four excellent and pertinent diagrams. . . . This book should prove a welcome aid to all practitioners having any interest in aural work."—*London Hospital Gazette*.

Crown 8vo. 5/6 net. Postage 4d.

DISEASES OF THE EAR IN SCHOOL CHILDREN.

An Essay on the Prevention of Deafness.

By JAMES KERR LOVE, M.D., F.R.F.P.S.

Lect. on Diseases of the Ear, Univ. of Glasgow; Aural Surgeon, Glasgow Royal Infirmary.

"It is one of the most sensible little books on this subject that we have ever read. We can with confidence recommend it."—*Medical Times*.

"This book makes interesting reading."—*Lancet*.

"I have tried to show that the 'Passing of Deafness' is not a utopian idea, but an eminently practical thing. A perusal of the whole book leaves one feeling that he has fully proved his contention. The book should be perused by every otologist. It contains lessons for all."—*Jour. of Laryngology*.

Bristol: John Wright & Sons Ltd. London: Simpkin & Co. Ltd.

Wright, Publishers, Bristol

Crown 8vo. 968 pp. 25/- net. Postage 1/-.

Synopsis of Medicine.

For Practitioners and Students.

By H. LETHEBY TIDY, M.A., M.D. (Oxon.), F.R.C.P. (Lond.),
Assistant Physician St. Thomas's Hospital; Physician Great Northern Central Hospital,
"We can say without hesitation that the book is far ahead of any medical synopsis
it has been our lot to encounter."—*Lancet*.

Now Ready. 5th Edition. Fully Revised, and with many new Illustrations
specially drawn for this Edition. Crown 8vo. 628 pp. 17/6 net. Postage 9d.

Synopsis of Surgery.

For Practitioners and Students.

With Diagrams of Surface Markings.

By ERNEST W. HEY GROVES, M.S., M.D., B.Sc.Lond., F.R.C.S.Eng.,
Surgeon to the Bristol General Hospital; Examiner in Surgery, Univ. of London, etc.

THE RAPID DEMAND FOR SUCCESSIVE EDITIONS OF THIS
WORK IS EVIDENCE OF ITS EXTREME USEFULNESS.

"May be regarded as complete in its range of subjects . . . the additions necessary to
keep it quite up to date have been freely made . . . The author is to be congratulated
on its readableness, its lucidity, and its fullness—notable qualities."—*Brit. Med. Jour.*
"This synopsis of surgery has had a wide sale, which has necessitated the issue of
frequent editions, and it deserves thoroughly all the success it has attained."—*Lancet*.

Crown 8vo. 220 pp. 7/6 net. Postage 9d.

Synopsis of Midwifery.

By ALECK W. BOURNE, B.A., M.B., B.C. (Camb.), F.R.C.S. (Eng.),
Obstetric Surgeon to Out-patients, St. Mary's Hospital; Obstetric Tutor,
St. Mary's Hospital Medical School, etc.

The principal points of obstetrics set out in a simple and concise manner.

"Based upon the best-known text-books, its teaching is not likely to lead the student
astray."—*Lancet*.

"A clear, full, and concise summary of present English teaching."—*Med. Press and
Circ.*

"This synopsis is well arranged and trustworthy . . . a condensation of the science
of midwifery which is sound in essentials and avoids extreme views."—*Hospital*.

Special Reduced Price for the above Set of 3 Volumes, 45/- net.

Large 8vo. Fully Illustrated. 18/6 net. Postage 9d.

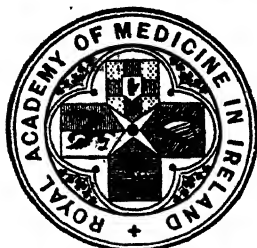
Injuries of The Peripheral Nerves.

By HENRY S. SOUTTAR, C.B.E., F.R.C.S. Eng., M.Ch. Oxon.,
Assist. Surgeon and Director of the Surgical Unit, London Hosp.;

And EDWARD W. TWINING, M.R.C.S., L.R.C.P. Lond.,
Med. Officer in Charge of Physical Treatment Dept., Pensions Hosp.

"This book is clearly the result of first-hand experience and much thought."—*Lancet*.

Bristol: John Wright & Sons Ltd. London: Simpkin & Co. Ltd.



THE DUBLIN :: JOURNAL OF :: MEDICAL SCIENCE

Edited by

A. K. HENRY, M.D., F.R.C.S.I.

*Recent Contributors
include—*

SIR W. I. DE C. WHEELER,
M.D.

HENRY F. MOORE, M.D.

A. E. BOYD, M.B., D.P.H.

BETHEL SOLOMONS, M.D.

SIR A. BULL, M.D. :

T. G. MOORHEAD, M.D. :

M. THOMPSON, M.R.C.P. :

G. FITZGIBBON, M.D. :

SIR J. W. MOORE, M.D. :

T. O. GRAHAM, M.A., M.D.

R. A. STONEY, F.R.C.S.I. :

WALLACE BRATTY, M.D. :

M. F. MOLONEY, M.B. :

J. S. ASHE, I.R.C.P.I. :

SEATON PRINGLE, M.D. :

H. V. EXNER, M.A. :

A. A. McCONNELL, M.B. :

A JOURNAL OF DISTINCTION.

DISTINCTION is written all over the DUBLIN JOURNAL OF MEDICAL SCIENCE. Its regular contributors are in the forefront of their profession. Its contents are read and re-read, discussed and noted in medical circles throughout the world.

Nearly one hundred years have passed since the Journal was founded, and all the famous men that Ireland has given to Medical Science have spoken in its pages. Their successors to-day use it for their messages.

Subscription Rates :

Single Copy - 2s. 6d. net, post free.

Yearly - - 25s. " "

SAVE 2/6 BY USING THIS ADVERT.

Cut out this Advertisement and send it with your cheque for £1 2s. 6d. net, and the Journal will be sent regularly, post free to you for twelve months.

Med. Ann. 1921.

THE JOURNAL AS AN ADVERTISING MEDIUM.

LIVE authoritative articles—such as appear continually in this Journal—give special pulling power to the space set aside for advertising. This is one of the reasons why the demand for space never slackens.

**RATE CARD ON REQUEST.
SPECIMEN SENT.**

The DUBLIN JOURNAL of MEDICAL SCIENCE,

40 LOWER ORMOND QUAY - - - DUBLIN.
LONDON OFFICE - 43 NEW OXFORD ST., W.C. 2

Published Quarterly, in May, August, November, and February.
Subscription 30/- net per annum, post free. Single Numbers 8/6 net.
The Second Volume commences in May.

The Journal of Neurology and Psychopathology.

ISSUED UNDER THE DIRECTION OF THE FOLLOWING EDITORIAL COMMITTEE :

Neurology.	Psychopathology.
S. A. KINNIER WILSON, M.A., M.D., B.Sc., F.R.C.P. (LONDON).	BERNARD HART, M.D. (LONDON).
T. GRAHAM BROWN, M.D., D.Sc. (CARDIFF).	HENRY DEVINE, M.D., F.R.C.P.
R. M. STEWART, M.B., D.P.M. (WHITTINGHAM).	MAURICE NICOLL, B.A., M.B. (LONDON). (PORT-MAUTH).
C. P. SYMONDS, M.D., M.R.C.P. (LONDON).	C. STANFORD READ, M.D. (SALISBURY).
CAREY F. COOMBS, M.D., F.R.C.P. (Bristol), <i>Editorial Secretary.</i>	

AS compared with Continental countries and America, British medical journalism has been slow to deal in adequate fashion with the advance of the last decennium in our knowledge of Nervous and Mental Diseases. THE JOURNAL OF NEUROLOGY AND PSYCHOPATHOLOGY is devoted to the furtherance of knowledge along entirely modern lines in all that pertains to the nervous system, and comprises:—

1. Original Papers dealing with Neurology and Psychology and any of their branches—Neurophysiology, Neuropathology, Psychotherapy, and so on;
2. Short Papers and Clinical Notes on cases of neurological or psychopathological importance;
3. Editorial Comment on Current Topics bearing on the matters with which the Journal is concerned;
4. Special Critical Reviews and Digests on subjects of neurological and psychological interest whereby the reader is kept abreast of the most recent research and expressions of opinion;
5. Selected Abstracts from Foreign Contributions to neurology and psychology and their various subdivisions, including endocrinology, from current literature;
6. And Reviews of recent books and monographs.

It is hoped thus to bring before the general medical reader, as well as the professing neurologist and psychologist, the results of modern work in organic and functional Nervous Disease; in Psychology and Psychopathology; in the Physiology of the Nervous System; in Vegetative Neurology (so-called) and Endocrinology; and in the application of modern research on these topics to the problems of practical and preventive medicine and sociology.

The general practitioner is increasingly aware of the very large part which the nervous system—using the term in its fullest meaning—plays in the causation of those disorders which he is daily called upon to treat. It is the endeavour of the Editorial Committee to furnish him with all available means for understanding and correcting these morbid processes.

The Journal adopts a catholic attitude in regard to divergent and sometimes conflicting trends of opinion and therapy in neurology and psychology, in the conviction that only good can result from public interchange of views. It is open to receive contributions from all different schools of thought in nervous and mental work, and provides a medium for the presentation of these to the profession generally.

Bristol : John Wright & Sons Ltd,

London : Simpkin & Co. Ltd,

Wright, Publishers, Bristol

A QUARTERLY JOURNAL DEVOTED TO SURGERY.

Richly Illustrated by the finest possible processes, both in
Colour and Black and White.

*Single Numbers, 12/6 net. Subscription 42/- net, per annum, post free.
Volumes, Bound Complete, 49/6 each.*

The 9th Volume commences in July. The subsequent numbers are
issued in October, January, & April. Title & Index with April number.

*Cases for binding, 4/- net post free; or each Volume will be bound
complete on receipt of the four Numbers, for 7/6 net, post free.*

The British Journal of Surgery

The ONLY PURELY SURGICAL JOURNAL Published in GREAT BRITAIN.

UNDER THE DIRECTION OF THE FOLLOWING EDITORIAL COMMITTEE:

- | | |
|--|--|
| <p>SIR BERKELEY G. A. MOYNIHAN, K.C.M.G., C.B. (Leeds), <i>Chairman.</i>
 GEORGE E. ARMSTRONG (Montreal)
 SIR GILBERT BARRING, Bart., C.B., C.B.E. (Birmingham)
 SIR WILLIAM BENNETT, K.C.V.O. (Lon.)
 JAMES BERRY (London)
 FREDERICK F. BURGHARD, C.B. (Lond.)
 FRANCIS M. CAIRD (Edinburgh)
 SIR W. WATSON CHEYNE, Bart., K.C.M.G., C.B., M.P. (London)
 W. H. CLAYTON-GREENE, C.B.E. (Lon.)
 HERBERT S. CLOGG (London)
 EDRED M. CORNER (London)
 SIR THOS. CRISP ENGLISH, K.C.M.G. (Lond.)
 CHARLES H. FAGGE (London)
 GEO. E. GASK, C.M.G., D.S.O. (London)
 SIR RICKMAN J. GODLEE, Bart., K.C.V.O. (London)
 SIR A. PEARCE GOULD, K.C.V.O., C.B.E. (Lond.)
 W. SAMPSON HANDLEY (London)
 RAYMOND JOHNSON, O.B.E. (London)
 SIR ROBERT JONES, K.B.E., C.B. (Liverpool)</p> | <p>SIR WM. ARBUTHNOT LANE, Bt., C.B. (Lond.)
 SIR ALEX. MACCORMICK (Sydney)
 SIR G. H. MAKINS, G.C.M.G., C.B. (Lon.)
 HENRY A. MOFFAT, D.S.O. (Capetown)
 RUTHERFORD MORISON (Newcastle)
 SIR HENRY MORRIS, Bart. (London)
 SIR THOMAS MYLES, C.B. (Dublin)
 R. H. PARRY (Glasgow)
 SIR D'ARCY POWER, K.B.E. (London)
 SIDNEY W. F. RICHARDSON (Cape)
 JAS. SHERREN, C.B.E. (Lond.) [town]
 THOMAS SINCLAIR, C.B. (Belfast)
 SIR HAROLD J. STILES, K.B.E. (Edin.)
 EDWARD H. TAYLOR (Dublin)
 SIR J. LYNN-THOMAS, K.B.E., C.B., C.M.G. (Cardiff)
 HY. ALEXIS THOMSON, C.M.G. (Edin.)
 SIR WM. THORBURN, K.B.E., C.B., C.M.G. (Manchester)
 GEORGE E. WAUGH (London)
 SIR W. I. de COURCY WHELER (Dublin)</p> |
|--|--|

E. W. HIEY GROVES (Bristol), *Editorial Secretary.*

Each number contains 150 to 180 pages, is fully illustrated, and made up of Original Papers, Critical Reviews, Descriptive accounts of Surgical Clinics at home and abroad, Short Notes of Instructive Mistakes, Rare and Obscure Cases, and Reviews of Surgical Books.

IT is the earnest endeavour of the Editorial Committee and the Publishers to present to English readers the world over, all that is best in the Surgery of the Empire in the brightest and most attractive form.

"Remarkable for the excellence of its illustrations."—*Brit. Med. Jour.*

"Even in a time like the present it has not in the least fallen short of the high standard which it set for itself in the first number . . . deserves vigorous support."—*Lancet.*

Bristol: John Wright & Sons Ltd. London: Simpkin & Co. Ltd.

FOUNDED 1823.

THE LANCET.

A Journal of British and Foreign Medicine, Surgery, Obstetrics,
Physiology, Chemistry, Pharmacology, Public Health, and News.

PUBLISHED EVERY FRIDAY.

PRICE 1s.

The Medical Profession in all Parts of the World

Will find in THE LANCET the best means of keeping themselves informed of the progress made in Medicine and Surgery and kindred subjects throughout the universe; and the wide scope of the subjects dealt with in the columns of THE LANCET will ensure to its readers valuable and reliable information in all matters which concern their especial interests in particular and those of the profession in general.

*SUBSCRIBERS' COPIES ARE DESPATCHED
BY FRIDAY'S MAILS TO ALL PARTS OF
THE WORLD*

• Terms of Subscription, Post Free.
Payable in Advance.

	ANNUAL	SIX MONTHS	THREE MONTHS
	£ s. d.	s. d.	s. d.
UNITED KINGDOM -	2 2 0	21 0	10 6
COLONIES AND ABROAD -	2 10 0	25 0	12 6

Drafts and Money Orders should be made payable to Mr. CHARLES GOOD, Manager.

Offices : 423 STRAND, LONDON, W.C. 2

THE HOSPITAL

The Workers' Newspaper of Administrative Medicine and
Institutional Life, Administration, National Insurance
and Health.

PUBLISHED EVERY THURSDAY.

TWOPENCE.

"THE HOSPITAL"—ITS POLICY AND CONTENTS.

AIMS: To provide a Journal for the whole hospital world and every type of worker it contains. These aims are accomplished with reasonable completeness every month. Thus every department of the modern hospital is dealt with, new developments and subjects are treated, and the interests of every group of workers are covered. The life-blood of the modern hospital is provided by labour through personal service as committee-men and honorary officials. The voluntary hospital system was never so strong or so necessary to England and the Empire as it is to-day, or the uses of *The Hospital* as the Workers Newspaper more manifest.

OBJECTS: To contain everything of practical value to all workers for the sick.

WHAT "THE HOSPITAL" CONTAINS:

Technical, Reliable articles on every current question as it arises.
Everything affecting Hospital Management, Economics and Administration.

SPECIAL DEPARTMENTS for:—The Poor-Law Institutions; Care and Treatment of Children; The Convalescent and Permanently Disabled; All Grades of Institutional Workers, their Interests, Ambitions, Advancement and Training; Architects and Hospital Managers interested in Construction, Architecture and Planning; The Busy Practitioner interested in Modern Methods of Treatment and in Practice.

Special Reports on Particular Hospitals and Institutions.
New Requirements and Original Schemes to meet Pressing Needs.
The Literature of the subject is fully treated in Reviews by experts.
All Practical Points and Matters for Equipment, Decoration and Furniture.
Nurse-Training Schools and the Higher Education of Matrons and Nurses.
Legal Notes and Legislation, including National and Institutional Insurance.

☐ *The Hospital* opens its columns to every worker in the fields covered, and the Editor's Letter Box grows in usefulness and interest continually.
Institutional Finance, Economics, the Raising of Revenue, Appeal Literature, the Annual Report and Accounts, all receive attention in turn.

☐ *The Hospital* is a File of Information, and has become a file of every important advertisement dealing with Vacancies, Supplies and other Essentials to Efficiency in Management and Daily Work.

Suggestions for New Sections and Enquiries on any topic from Committee-men and other Workers are always welcomed by the Editor.

TERMS OF SUBSCRIPTION:

	s.	d.	
FOR ONE YEAR	-	-	13 0
" SIX MONTHS	-	-	6 6
" THREE MONTHS	-	-	3 3
			Great Britain, Foreign & Colonial (Post Free).

"THE HOSPITAL" can be obtained of all Booksellers and Newsagents and at all Railway Bookstalls in the United Kingdom.

**PUBLISHING
OFFICES:**

"THE HOSPITAL" BUILDING,
28/29, Southampton St., Strand, LONDON, W.C. 2

— THE —

Medical Press and Circular. .

ESTABLISHED EIGHTY-THREE YEARS.

(The OLDEST Weekly Medical Journal in existence, with one exception.)

IT is much the **cheapest** of the three recognized leading weekly Medical Journals in Great Britain, numbers among its contributors the most able writers and acknowledged authorities, is widely read and influentially supported.

“The Periphery,” “Clinical Lectures,” “Foreign Papers and Correspondence,” are special features of the Journal; at the same time it *devotes more space to Irish and Scotch Medical affairs and Society Reports than any other London Journal.*

Its tone is bright, fearless, and strictly impartial, its contents succinct, it belongs to no clique or party, and to the General Practitioner it is of special interest, immediate attention and space being always accorded to matters affecting his interests, and to papers and letters of practical moment.

Published on Wednesdays, it forms as it were a necessary link with the Saturday Journals; being only TWENTY-ONE SHILLINGS, payable at any time during the year.

A Special Edition is printed on thin plate paper for Indian, Colonial, American, and Foreign Subscribers at 23/6 per annum post free, if paid in advance only.

SPECIMEN COPIES SENT POST FREE ON APPLICATION.

As an Advertising Medium it has been patronized continuously by all the leading houses for the last three-quarters of a century. Beyond its extensive medical circulation, it is also taken at **ALL THE LEADING CLUBS.** Terms on application to the Publishers—

BAILLIERE, TINDALL & COX,
8 Henrietta St., Strand, London, W.C.2
and 29 NASSAU STREET, DUBLIN.

THE Medical Officer

A weekly record of public
health and allied topics,
dealing with all matters of
medico-sociological interest.

Established in 1908, "THE MEDICAL OFFICER" at once took a recognised position amongst the leading medical journals. It now enjoys a large and increasing circulation throughout the British Empire, and in
—the United States of America.—

ANNUAL SUBSCRIPTION (Post Free):
At Home and Abroad, 30/-

The Recognised Service Journal for
Medical Officers of Health, School
Medical Officers, Venereal Disease
Officers, Tuberculosis Medical Officers,
Medical Officers of Maternity and
Infant Welfare Centres, Medical Super-
intendents of Sanatoria, Fever Hospitals,
etc., etc.

36-38 WHITEFRIARS STREET, LONDON, E.C.4
ENGLAND.

The
BRITISH JOURNAL
of
TUBERCULOSIS

EDITED BY

T. N. KELYNACK, M.D.

A British Journal devoted exclusively to all aspects of the Tuberculosis Movement.

It is a thoroughly representative and authoritative scientific Quarterly, dealing with all medico-sociological questions relating to the Tuberculosis Problem.

Its articles are from experts in all parts of the English-speaking world. It provides reliable information concerning every phase of the Question. It affords means for the co-operation of workers, and the co-ordination of practical measures of every kind of Tuberculosis work.

Its pages are a channel for the expression of the results of original research.

Special attention is given to the study of the Tuberculosis Problem under Present-day Conditions.

It is an indispensable Journal for Medical Officers of Health, Tuberculosis Officers, Members of the School Medical Service, General Practitioners, and all working for the prevention and arrest of Tuberculosis.

PUBLISHED QUARTERLY.

Single Copies, 2/6 (80 cents) ; Post Free, 2/9 (85 cents).

Annual Subscription, 10/- Post Free (\$2.50 Post Free).

BAILLIÈRE, TINDALL & COX,

8, HENRIETTA STREET, COVENT GARDEN, LONDON, W.C. 2.

THE BRISTOL
Medico-Chirurgical
Journal.

PUBLISHED QUARTERLY, PRICE 3/-
ANNUAL SUBSCRIPTION, POST FREE, 10/6

EDITOR:

P. WATSON-WILLIAMS, M.D.

*Laryngologist and Rhinologist to the Bristol Royal Infirmary; Lecturer
on Diseases of the Throat, Nose, and Ear, University of Bristol.*

WITH WHOM ARE ASSOCIATED

J. LACY FIRTH, M.D., M.S., F.R.C.S., Surgeon to the
Bristol General Hospital.

JAMES SWAIN, C.B., C.B.E., M.D., M.S., F.R.C.S., Surgeon
to the Bristol Royal Infirmary, and Professor of Surgery,
University of Bristol.

J. A. NIXON, C.M.G., B.A., M.D., F.R.C.P., Physician to the
Bristol Royal Infirmary, *Assistant Editor*.

J. M. FORTESCUE-BRICKDALE, M.A., M.D., M.R.C.P.,
Physician to the Bristol Royal Infirmary, *Editorial Secretary*.

CAREY F. COOMBS, M.D., F.R.C.P., Physician to the Bristol
General Hospital.

Books for Review and Exchange Journals should be sent to the
Assistant Editor, The Medical Library, University of Bristol.

Communications referring to the Delivery of the Journal, Subscribers'
Names, and Orders for Advertisements should be sent the Editorial Secretary,
Dr. J. M. FORTESCUE-BRICKDALE, 52, Pembroke Road, Clifton, Bristol.

BRISTOL: J. W. ARROWSMITH LTD.
LONDON: SIMPKIN, MARSHALL, HAMILTON, KENT & CO. LTD.

THE MIDDLESEX HOSPITAL MEDICAL SCHOOL.

University of London.

THE Hospital and Medical School are fully equipped for teaching the entire medical curriculum, including instruction in Maternity Wards and all Special Departments.

HOSPITAL APPOINTMENTS.

The following appointments, besides the usual Clerkships and Dresserships, are open to all General Students without extra fee:

Resident Officers to the Special Departments	} 2 appointments annually for six months
House Physicians	
House Surgeons	6 " " "
Obstetric and Gynæcological	8 " " "
House Surgeons	} 2 " " "
Resident Anæsthetists	
	2 " " "

The Medical, Surgical, and Obstetric and Gynæcological Registrars are appointed by the Weekly Board, on the recommendation of the Medical Committee, as vacancies arise.

The Medical and Surgical Casualty Officers are appointed in the same manner (salary value £150 a year each, with board and residence).

SCHOLARSHIPS AND PRIZES.

Three Entrance Scholarships, of the value of £100, £50 and £25 respectively. A University Scholarship in Anatomy and Physiology, value £50, open to Students of Universities of the United Kingdom who have already passed or completed the curriculum for the professional examinations in Anatomy and Physiology, are offered for competition at the beginning of the Winter Session.

Two Broderip Scholarships of the value of £60 and £40 respectively, are awarded every year for proficiency in Clinical Knowledge.

The Murray Gold Medal and Scholarship (£25), founded in connection with the University of Aberdeen, is awarded every third year to a Student of The Middlesex Hospital.

The following are awarded annually :

- The Hetley Prize, value £25 (Clinical Medicine, Surgery and Obstetrics).
- The Lyell Medal and Scholarship, value £55 (Surgical Anatomy and Practical Surgery).
- The Leopold Hudson Prize, value 11 guineas (Surgical Pathology and Bacteriology).
- The Freeman Scholarship, value £30 (Obstetric Medicine and Gynæcology).
- Second Year's Exhibition, value £10 10s. (Anatomy and Physiology).
- "Richard Hollins" Research Scholarship, £100.
- Cancer Research Scholarship, £60.
- New Zealand Students' Scholarship, the clinical advantages of the Hospital for one year free.

The Tutors assist all Students, especially those who are preparing for examinations, without extra fee: thus the necessity of obtaining private instruction is obviated.

There are a Gymnasium and ♦ Students' Common Rooms,
Restaurant in the Hospital. ♦ Athletic Clubs.

Full particulars and detailed prospectus may be obtained on application to:

A. E. WEBB-JOHNSON, C.B.E., D.S.O., F.R.C.S., Dean of the Medical School,
Middlesex Hospital, London, W.1.

GUY'S HOSPITAL.

(University of London)

Founded by Thomas Guy 1731]

[Contains 613 Beds

MEDICAL AND SURGICAL STAFF.

Consult. Phys.: G. Newton Pitt, M.D., Sir E. Cooper Perry, M.A., M.D., Sir William Hale White, K.B.E., M.P., L. E. Shaw, M.D.
Consult. Surg.: C. H. Golding-Bird, M.B., W. H. A. Jacobson, M.A., M.Ch., Sir Charles J. Symonds, K.B.E., C.B., M.S., Sir W. Arbuthnot Lane, Bart., M.S.
Consult. Phys. for Mental Diseases: Sir Geo. Savage, M.D.
Consult. Anaesthetists: Tom Bird, M.A., and C. J. Ogilvie, Esq.
Consult. Phys. for Skin Diseases: Sir E. Cooper Perry, M.A., M.D.
Consult. Dental Surg.: F. Newland-Pedley, Esq., W. A. Maggs, Esq., R. Wynne Rouw, Esq.
Phys. and Assist. Phys.: J. F. Swetts, M.D., A. P. Liddard, M.A., M.D., H. S. French, C.B.E., M.A., M.D., A. F. Hurst, M.A., M.D., G. H. Hunt, M.D., R. P. Poulton, M.D., N. Mutch, M.D., J. A. Hyle, M.D., G. Marshall, M.D.
Ophthalmic Phys.: G. Bellingham Smith, B.S., and H. Chapple, M.Ch.
Phys. in Psychological Medicine: Sir Maurice Craig, K.B.E., M.A., M.D.
Phys. in charge of the Department for Nervous Diseases: A. F. Hurst, M.A., M.D., Assist. Phys. C. P. Symonds, M.D.
Phys. in charge of the Department for Diseases of Children: H. C. Cameron, M.A., M.D.
Surg. and Assist. Surg.: Sir Alfred Frupp, K.C.V.O., C.B., M.S., F. J. Steward, M.S., C. H. Fagge, M.S., R. P. Rowlands, M.S., P. Turner, M.S., E. C. Hughes, M.A., M.Ch., R. Davies Colley, C.M.G., M.A., M.Ch., L. Bromley, M.A., M.Ch., E. G. Slesinger, J.R.S.

Surg. in charge of Throat and Ear Department: W. M. Mollison, M.A., M.Ch. and T. B. Layton, D.S.O., M.S.
Ophthalmic Surg.: H. L. Eason, C.B., C.M.G., M.D., M.S., and A. W. Ormond, Esq., C.B.E.
Surg. in Actino Therapeutic Dept.: C. E. Iredell, M.D.
Surg. in charge of the Orthopaedic Dept.: W. H. Trethowan, B.S., A. H. Todd, M.S.
Surg. in charge of Genito-Urinary Dept.: A. R. Thompson, Ch.M.
Phys. in charge of Dept. for Skin Diseases: H. W. Barber, M.B., B.Ch.
Officer in charge of Tuberculosis Dept.: G. Marshall, M.D.
Chemical Pathologist: J. H. Ryffel, M.A., B.Ch.
Morbid Histologist: G. W. Nicholson, M.D.
Dental Surg.: M. F. Hopson, Esq., J. B. Parfitt, Esq., J. Lewin Payne, Esq., E. B. Dowsett, Esq., D.S.O.
Assist. Dental Surg.: F. J. Pearce, Esq., H. C. Malleson, Esq., F. N. Doubleday, Esq., F. R. Bull, Esq. (with charge of Children's Dept.), G. L. Pritchard, Esq.
Director of Physiotherapeutic Laboratory: W. K. Fry, Esq.
Anaesthetists: F. E. Shipway, M.D., E. A. Scott, Esq., A. D. Marston, Esq., N. E. Kendall, Esq., V. E. Lloyd, Esq., C. H. St. John, Esq.
Radiologist: Prof. J. W. H. Eyre, M.D.
Radiographers: W. Lindsay Locke, M.B., B.Ch., J. M. Redding, Esq.
Curator of Museum: R. Davies Colley, C.M.G., M.Ch.
Dean of Medical School: Prof. T. B. Johnston, M.Ch., Ch.B.

WINTER AND SPRING TERMS—LECTURES.

Chemistry: Prof. C. S. Gibson, M.A., M.Sc. *Experimental Physics*: A. H. Fison, D.Sc. *Biology*: T. J. Evans, M.A. *Anatomy*: Prof. T. B. Johnston, M.B. *Physiology*: Prof. M. S. Pembrey, M.A., M.D., Sir William Dunn. *Lecturer on Pathology*: P. P. Laidlaw, M.B. *Bacteriology*: Prof. J. W. H. Eyre, M.D. *Medicine*: The Physicians. *Surgery*: The Surgeons. *Ophthalmic Surgery*: H. L. Eason, C.B., C.M.G., M.D., M.S. *Psychological Medicine*: Sir M. Craig, K.B.E., M.A., M.D. *Hygiene*: R. King Brown, M.D. *Anaesthetics*: F. E. Shipway, M.D.

DEMONSTRATIONS.

Chemistry: Prof. C. S. Gibson and Demonstrators. *Physics*: Dr. Fison and Demonstrator. *Biology*: T. J. Evans, M.A., and Demonstrator. *Anatomy*: Prof. T. B. Johnston, and Demonstrators. *Practical Physiology*: Prof. Pembrey and Demonstrators. *Gen. Pathology*: Drs. Laidlaw and Nicholson. *Morbid Anatomy*: Dr. Hunt, Dr. Poulton, Dr. Mutch, Dr. Ryle. *Med. Pathology*: Dr. Hunt. *Surg. Pathology*: Mr. R. Davies-Colley. *Prac. Bacteriology*: Prof. Eyre. *Med. Classes*: Dr. Poulton. *Surg. Classes and Oper. Surgery*: Mr. Turner and Mr. Hughes. *Midwifery Classes*: Mr. Chapple. *Practical Pharmacy*: The Hospital Pharmacist.

SUMMER TERM—LECTURES.

Chemistry: Prof. C. S. Gibson. *Experimental Physics*: Dr. Fison. *Biology*: Mr. Evans. *Anatomy*: Prof. Johnston. *Physiology*: Prof. Pembrey, and Sir William Dunn. *Lecturer on Pathology*: Dr. Laidlaw. *Bacteriology*: Prof. Eyre. *Medicine*: The Physicians. *Surgery*: The Surgeons. *Midwifery and Gynaecology*: Mr. G. Bellingham Smith and Mr. H. Chapple. *Ophthalmic Surgery*: Mr. Eason. *Psychological Medicine*: Sir Maurice Craig. *Materna Medica*: Dr. A. F. Hurst. *Hygiene*: Dr. R. King Brown. *Anaesthetics*: Dr. Shipway. *Medical Jurisprudence*: Mr. J. H. Ryffel.

DEMONSTRATIONS.

THE ARRANGEMENTS ARE THE SAME AS FOR THE WINTER SESSION.

Special Classes are held in the Hospital for Students preparing for the Examinations of the Universities of London, Oxford, and Cambridge, and other higher examinations. Clinical lectures are delivered each week during the Summer and Winter Sessions on Medicine or Surgery, and on one of the special subjects. These lectures are given in turn by one of the Physicians or Assistant Physicians, Surgeons or Assistant Surgeons, or by one of those in charge of the Special Department. *Lying-in Charity*—Number of Cases attended Annually, about 8000. *Midwifery and Diseases of Women*—32 Beds. *Ophthalmic Cases*—33 Beds. *Throat Cases*—5. *Ear Cases*—5. *Genito-Urinary Cases*—5. *Gordon Museum of Anatomy, Pathology, and Comparative Anatomy*—contains 11,000 specimens, 450 drawings and diagrams, an unique collection of Anatomical Models, and a series of 60 Models of Skin Diseases. *APPOINTMENTS*.—The House Surgeons and House Physicians, the Obstetric Residents, Clinical Assistants and Dressers, are selected from the Students according to merit and without payment. There are also a large number of Junior Appointments, every part of the Hospital practice being systematically employed for instruction. *ENTRANCE SCHOLARSHIPS*.—Four Open Scholarships, One Hundred and Twenty Pounds, One Hundred Pounds, Fifty Pounds, and Forty Pounds, in Chemistry, Physics, Botany, Zoology, Classics, Mathematics and Modern Languages. Three Scholarships open to University Students, of the value of Eighty Pounds, Seventy-five Pounds, and Thirty-five Pounds, in any two of the following Subjects: Anatomy, Physiology, General Pathology, Pharmacology, Organic Chemistry. *PRIZES AND STUDENTSHIPS* are awarded to Students in the various years, amounting in the aggregate to more than Six Hundred Pounds. A DENTAL SCHOOL is attached to the Hospital, which affords to Students all the instruction required for a licence in Dental Surgery. THE RESIDENTIAL COLLEGE accommodates about Fifty Students. A Prospectus containing full particulars as to fees, lectures, classes and course of study advised may be obtained on application to the DEAN, GUY'S HOSPITAL, LONDON BRIDGE, S.E.1.

ST. THOMAS'S HOSPITAL MEDICAL SCHOOL,

(University of London),

WESTMINSTER BRIDGE, S.E.1.

DEAN: SIR CUTHBERT S. WALLACE, K.C.M.G., C.B.

The Hospital contains over 600 Beds, and a large well-organized Out-Patient Department.

The HOSPITAL AND MEDICAL SCHOOL are situated on the River, opposite the Houses of Parliament, and are easily accessible by Train, Tram, and 'Bus, from all parts of London.

The SCHOOL BUILDINGS are completely equipped and thoroughly up-to-date.

Classes and Lectures in the PRELIMINARY AND INTERMEDIATE SUBJECTS provide complete instruction for all University and the Conjoint Board Examinations.

The facilities for CLINICAL WORK are second to none in London. Clerks and Dressers, who work under the immediate supervision of the Visiting Staff, are appointed every three months in all General and Special Departments of the Hospital.

The institution of CLINICAL MEDICAL AND SURGICAL UNITS, offers special advantages to those desiring advanced instruction and practice in these Subjects. The Unit Laboratories are fully equipped for the routine investigation of disease and for research work.

In connection with the Department of Obstetrics and Gynæcology all Students attend the practice of the MATERNITY WARD, before proceeding to work in the district.

The SPECIAL DEPARTMENTS IN THE HOSPITAL provide clinical instruction in all these Subjects.

SPECIAL CLASSES are held for the F.R.C.S., Primary and Final, and other higher Examinations.

HOUSE APPOINTMENTS, Resident and Non-Resident, and Salaried RESEARCH APPOINTMENTS are numerous, and are open to all Students after Qualification.

The SPORTS' GROUND is within easy reach of the Hospital.

FEES: For the first year's Course of Study in Preliminary Subjects, **£25.**
For each subsequent year, **£50.**

Full particulars may be had from—

THE MEDICAL SECRETARY,

ST. THOMAS'S HOSPITAL MEDICAL SCHOOL,
WESTMINSTER BRIDGE, S.E.1.

— THE —

Hospital for Sick Children

GREAT ORMOND STREET, W.C. 1.

Clinical Instruction is given daily by Members of the Visiting Staff in the Wards, Out-patient Department, Operating Theatre and Post-mortem Room.

Clinical Clerkships and Dresserships in the Wards and Clinical Assistantships in the Out-patient Department are also available for Students and Post-Graduates, both men and women. Two months of the time spent as Clerks or Dressers by Undergraduate Students is recognized by the Universities of London, Oxford, Cambridge, etc., and by the conjoint Examination Board of England for their final examinations.

Fees for Hospital Attendances: One Month's Ticket, £2 2s. Three Months' Ticket, £5 5s. Perpetual Ticket, £10 10s.

Special Reduced Fee for Clinical Clerks for one month, £1 1s.

Pathological Clerkships.—Facilities are afforded for obtaining Theoretical and Practical Instruction in Clinical Pathology and Bacteriology in the Pathological Laboratories. Clerks attend for about four hours daily. Fees:—For one month, £3 3s. For two months, £5 5s. For three months, £6 6s.

A reduction is made in the case of those already holding tickets for general attendance at the Hospital.

Further particulars may be obtained from the Secretary or the Dean.

O. L. ADDISON, F.R.C.S., *Dean to the Medical School.*

WILFRED J. PEARSON, D.M., *Sub-Dean to the Medical School.*

ST. JOHN'S HOSPITAL

For Diseases of the Skin

(INCORPORATED).

IN-PATIENT DEPARTMENT (40 BEDS)—262 UXBRIDGE ROAD, W.12

OFFICES AND OUT-PATIENT DEPARTMENT—

49 LEICESTER SQUARE, W.C. 2.

The Out-Patient Practice may be attended free by Medical Practitioners every day at 2 p.m. and (except Saturday) at 6 p.m.

THE OUT-PATIENT DEPARTMENT contains Laboratory, Lecture Room, Electrical Department and Medicated Vapour Baths. **VENEREAL DISEASES** are treated under the Government Scheme. **CLINICAL DEMONSTRATIONS** are given at 2 p.m. every Monday (Dr. W. GRIFFITH), Tuesday (Dr. L. L. BUNCH), Wednesday (Dr. W. GRIFFITH), Thursday (Dr. KNOWSLEY SIBLEY), Friday (Dr. M. G. HANNAY), Saturday (Dr. E. J. D. MITCHELL), on selected cases.

CHESTERFIELD LECTURES.—These free Lectures are given on Thursdays at 6 o'clock, during the Winter months, and are followed by Demonstrations and Clinical Instruction on Special Cases. For dates and lecturers see medical papers.

GEORGE A. ARNAUDIN, *Secretary-Superintendent.*

WESTMINSTER HOSPITAL

MEDICAL SCHOOL

(UNIVERSITY OF LONDON)

1920-1921. THE TERMS BEGIN ON OCTOBER 1, JANUARY 14, and APRIL 27.

COURSES OF STUDY.—Full Curriculum for the Preliminary, Intermediate, and Final Examinations of the University of London and of the Conjoint Examining Board of the Royal Colleges of Physicians and Surgeons.

FEES.—Annual Composition Fee, 35 Guineas.

ENTRANCE SCHOLARSHIPS.—The following Scholarships may be competed for during the year:

Two, of £50 each, in Anatomy and Physiology	-	April 21, 22, 1921.
One in Arts, of the value of £60	: : :	} June 29, 1921.
Two in Science (£60 and £30)	: : :	
Two, of £50 each, in Anatomy and Physiology, September 23, 24, 1921.		

The April Scholarships are open to students entering for the Summer session, and the others to those prepared to enter in October. Those in Anatomy and Physiology are open to students of any University in the United Kingdom or British Dominions. Women Students are admitted.

HOSPITAL APPOINTMENTS.—All Students are provided with Clerkships and Dresser-ships, and are at once eligible, when they have passed the Final Examination, for the posts of House Physician, House Surgeon, and Resident Obstetric Assistant. Unrivalled opportunities are afforded for holding the appointments.

For further particulars apply to:

DR. A. S. WOODWARD, C.M.G., C.B.E., M.D., F.R.C.P., *Dean,*
Medical School, 12 Caxton Street, S.W.1.

THE LONDON LOCK HOSPITALS.

Female Hospital: 283 Harrow Road, W.9.

Male Hospital: 91 Dean Street, W.1.

There are Private Wards at both Hospitals.

Offices: 283 Harrow Road, London, W.9.

Full particulars regarding admission of Patients can be obtained from the Secretary.

ROYAL DENTAL HOSPITAL OF LONDON.

SCHOOL OF DENTAL SURGERY (University of London),
Leicester Square, London, W.C.2.

THIS SCHOOL is thoroughly equipped for Teaching Dental Surgery. The CLINIC of the Hospital is UNRIVALLED.

DENTAL MECHANICS.—Pupils can join AT ANY TIME for the two years' Training in Dental Mechanics.

WOMEN are admitted as Students, and are eligible for all appointments and prizes.

For further particulars apply THE DEAN.

UNIVERSITY of BRISTOL.

FACULTY OF MEDICINE.

THE University affords complete courses of instruction for its own examinations, those of the University of London, and those of the Conjoint Board, etc., for Medical Degrees or Diplomas. The Dental and Public Health Departments afford the necessary instruction for the Degrees and Diplomas of the University and of other examining bodies in those subjects.

The University confers the following Degrees and Diplomas :—

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY	M.B., Ch.B
MASTER OF SURGERY	Ch.M.
DOCTOR OF MEDICINE	M.D.
BACHELOR OF DENTAL SURGERY	B.D.S.
MASTER OF DENTAL SURGERY	M.D.S.
DIPLOMA IN DENTAL SURGERY	L.D.S.
DIPLOMA IN PUBLIC HEALTH	D.P.H.

The early part of the curriculum so interlocks with the curriculum for the B.Sc. that the Medical student may without much loss of time take also the degree of B.Sc. Moreover, the Dental student may in seven years take both Dental and Medical degrees. The whole of the Dental Mechanical work for the Bristol Royal Infirmary and the Bristol General Hospital is done in the University laboratory by the students, instructed by skilled mechanics.

CLINICAL WORK is done at the Bristol Royal Infirmary, and the Bristol General Hospital, which together contain over 550 beds. The Bristol Royal Hospital for Sick Children and Women, the Bristol Eye Hospital, the Bristol City and County Asylum, and the Bristol City Fever Hospital are also open for the clinical instruction of students.

SCHOLARSHIPS.—There is no entrance scholarship, but students from the City of Bristol may, on their merits, receive financial aid from the City Scholarship Fund on application to the City Scholarship Committee.

Several Scholarships and Prizes are open to students during their Hospital career.

HOSPITAL APPOINTMENTS open to students after qualification.

At the Bristol Royal Infirmary.—Two House Surgeons, two House Physicians (of these one is chosen as Senior Resident Officer), one Resident Obstetric Officer, one Throat, Nose and Ear House Surgeon, one Ophthalmic House Surgeon, one Casualty Officer, and one Dental House Surgeon.

At the Bristol General Hospital.—One Senior House Surgeon, one Casualty House Surgeon, two House Physicians, one House Surgeon, and one Dental House Surgeon. All these appointments are salaried, with board and residence.

For further particulars and prospectus apply to the DEAN of the Faculty of Medicine,

UNIVERSITY OF DURHAM

COLLEGE OF MEDICINE, NEWCASTLE-ON-TYNE

DEGREES IN MEDICINE, SURGERY AND HYGIENE; DIPLOMAS IN PUBLIC HEALTH AND PSYCHIATRY, AND LICENCE IN DENTAL SURGERY.—Six Degrees, two Diplomas, and one Licence are conferred by the University of Durham—*viz.*, the Degrees of Bachelor of Medicine, Bachelor of Surgery, Doctor of Medicine, and Master of Surgery; Bachelor of Hygiene, and Doctor of Hygiene; the Diplomas in Public Health and Psychiatry, and the Licence in Dental Surgery. These Degrees, etc., are open to Men and Women.

Attendance at the University of Durham College of Medicine during one of the five years of professional study, or subsequently to qualification elsewhere, is required as part of the curriculum for the Degrees, except in the case of Practitioners of more than fifteen years' standing, who, having attained the age of forty years, can obtain the Degree of M.D. after examination only.

The first three Examinations for the Degrees of M.B. and B.S. may be passed prior to the commencement of attendance at Newcastle.

A candidate who has passed the First and Second Examinations of the University will be exempt from the First and Second Examinations of the Conjoint Board in England, and will be entitled to present himself for the Final Examination of the Board on the completion of the necessary curriculum. Students who have satisfied the requirements of the General Medical Council as regards Registration, in some Examination other than the Durham Matriculation, or its equivalent, may enter on a course of study for a degree in Medicine upon satisfying the Examiners of the University of Durham in three of the subjects of the Matriculation Examination (exclusive of Religious Instruction and Elementary Mathematics), provided that one of them is a language other than English. In the case of a Student who spends only one year at Newcastle, the necessary subjects of the Matriculation Examination must be passed at least 12 months previously to the candidate's entry for his Final Examination for the Degrees.

Students can complete, at the University of Durham College of Medicine, Newcastle-upon-Tyne, the entire course of professional study required for the above degrees, and for the Diplomas in Public Health and Psychiatry; also for the examinations of the Royal Colleges of Physicians and Surgeons, and for the Army and Navy Examination Boards.

A Dental curriculum is provided, and a Licence in Dental Surgery may be obtained after Examination.

All information is given in the Calendar of the University of Durham College of Medicine, Newcastle-on-Tyne, which may be obtained gratis from the Registrar at the College.

Scholarships, &c.—University of Durham Scholarship, value £100 for proficiency in Arts, awarded annually to full students in their first year only. The Pears Scholarship—value £150—for proficiency in Arts. Dickinson Scholarship—value the interest of £400, and a Gold Medal—for Medicine, Surgery, Midwifery, and Pathology. Tulloch Scholarship—value the interest of £400—for Anatomy, Biology, Chemistry, and Physics. Charlton Scholarship—value the interest of £700—for Medicine. Gibb Scholarship—value the interest of £500—for Pathology. Luke Armstrong Scholarship—interest on £680—for comparative Pathology. Stephen Scott Scholarship—interest on £1000—for Surgery. Heath Scholarship—the interest on £4000 for Surgery, to be awarded every second year. Phillpotts Scholarships (3)—interest of £1800, to be awarded in connection with the Final M.B., B.S. Examinations in March and June. Gibson Prize—value the interest of £250 Stock—for Midwifery and Diseases of Women and Children. The Turnbull Prize and Medal—for Surface Anatomy. The Outerson Wood Prize—value the interest of £250—for Psychological Medicine. The Goyder Memorial Scholarship (at the Infirmary)—value the interest of £325—for Clinical Medicine and Clinical Surgery. At the end of each Session, a Prize of Books is awarded in each of the regular Classes. Assistant Demonstrators of Anatomy, Prosectors, and Assistant Physiologists are elected yearly. Pathological Assistants, Assistants to the Dental Surgeon, Assistants in the Eye Department, Clinical Clerks and Dressers are appointed every three months.

The Royal Victoria Infirmary contains over 400 beds. Clinical Lectures are delivered by the Physicians and Surgeons in rotation. Pathological Demonstrations are given as opportunity offers, by the Pathologist. Practical Midwifery can be studied at the Newcastle Maternity Hospital, where there is an out-door practice of over 1000 cases annually.

FEES.

- (a) A Composition Ticket for Lectures at the College may be obtained—
 - I.—By payment of £122 on entrance.
 - II.—By payment of £82 at the commencement of the First Year, and £54 at the commencement of the Second Year.
 - III.—By three annual instalments of £61 10s., £47 10s., and £41 respectively, at the commencement of the Sessional year.
 - (b) Fees for attendance on Hospital Practice:—
 - For 3 Months' Medical and Surgical Practice, £12 12s. For 6 months', £15 15s. For 1 year's, £21. For Perpetual, £46.
 - Or by two instalments—First year, £26; Second year, £23.
 - In addition to the above fees, the Committee of the Royal Victoria Infirmary require the payment of 2 guineas yearly up to three years from every Student attending the Infirmary. For six months, or any shorter period, this fee is 1 guinea. After three years of attendance, such payment will be no longer necessary.
 - (c) Single courses of Lectures, £8 10s. 6d.
 - (d) A Composition Ticket for the courses of Lectures and Practical work of the first two years of the curriculum, may be obtained by the payment of £68 on entrance.
 - (e) Composition fee for Lectures, etc., at College for Licence in Dental Surgery, 42 guineas; Composition fee for Practical work at Dental Hospital, £57 10.
 - (f) Composition fee for courses of instruction for the Diploma in Psychiatry, £35.
- Fees for Lectures, etc., at the College and for Hospital Practice, must be paid to the Registrar; and fees for Practical Dental Work to the Dean of the Dental Hospital—at the time of entry.

Further particulars may be obtained from the Registrar, PROF. HOWDEN, at the College.

ROYAL EYE HOSPITAL.

London School of Ophthalmic Surgery and Medicine.

ST. GEORGE'S CIRCUS, SOUTHWARK, S.E. 1.

Consulting Surgeon—Sir W. J. COLLINS, K.C.V.O., M.D., M.S., B.SC., F.R.C.S.

Surgeons—L. VERNON CARGILL, F.R.C.S.; G. BROOKSBANK JAMES, F.R.C.S.; J. STROUD HOSFORD, F.R.C.S. (ED.); ARTHUR D. GRIFFITH, M.B., B.S., F.R.C.S.; E. ARTHUR DORRELL, F.R.C.S.

Assistant Surgeon—T. WILFRED LETCHWORTH, M.B., B.C., F.R.C.S.

Physician—JAMES COLLIER, M.D., B.SC., F.R.C.P.

Dean—A. D. GRIFFITH, M.B., B.S., F.R.C.S.

Lectures, Clinical Demonstrations, Instruction in Refraction Work, and Instruction in Pathology, &c., are given by the Teaching Staff of the Hospital. Clinical Instruction is given daily in the Out-Patient Department at 2 p.m. There are annually more than 21,000 new patients attending the Hospital, and excellent opportunity is afforded to Practitioners and Medical Students to acquire a practical knowledge of Ophthalmology.

The instruction at the School is recognized by the University of London and the Royal Colleges of Physicians and Surgeons for the purposes of their examinations in Ophthalmology. For further particulars apply to the Dean.

PINES SANATORIUM,

Kelling, near HOLT, NORFOLK.



For the treatment of
PULMONARY
and other forms of
TUBERCULOSIS. .

Large average of sunshine.
Sheltered situation in pine
woods. Small rainfall.
Grounds of 20 acres. The
surrounding country is well
known for its great beauty.

For Prospectus and full
particulars apply:
THE SECRETARY.

HOSPITAL for CONSUMPTION & DISEASES OF THE CHEST, Brompton

and SANATORIUM at FRIMLEY.

Students and qualified men are admitted to the practice of the Hospital and the Lectures on payment of a Fee of Two Guineas for One Month; Four Guineas for Three Months; Seven Guineas for Six Months. Clinical Assistants to the Out-Patients' Department are appointed for Six Months, and are expected to join the practice of the Hospital for that period. A certificate is given to those who have attended a six months' course with satisfaction. The Hospital practice includes out-patient and in-patient clinics. Demonstrations in the Clinical Laboratory, Museum and Special Departments, and Artificial Pneumothorax.

Full particulars can be obtained from the Dean, as well as forms of application for appointments.
L. S. BURRELL, Dean.

. . THE . .

UNIVERSITY OF LIVERPOOL

FACULTY OF MEDICINE.

The University grants degrees in Medicine, Surgery, Hygiene, Dental Surgery, and Veterinary Science, and Diplomas in Public Health, Tropical Medicine, Veterinary Hygiene, Medical Radiology and Electrology, and a Licence in Dental Surgery.

Students may also prepare in the University for the examinations of other licensing bodies.

Medical School Buildings.—The buildings of the Medical School are all modern, and contain spacious lecture rooms, and well-equipped laboratories and class-rooms for the study of all the more important subjects which form the basis of medicine. In addition, laboratories are provided for medical research in Bio-chemistry, Tropical Medicine, Physiology, Pathology, Bacteriology, and Hygiene.

Hospitals.—The Clinical School consists of four general hospitals—the Royal Infirmary, the David Lewis Northern Hospital, the Royal Southern Hospital, and the Stanley Hospital; and of five special hospitals; the Eye and Ear Infirmary, the Hospital for Women, the Infirmary for Children, St. Paul's Eye Hospital, and St. George's Hospital for Skin Diseases. These hospitals contain in all a total of 1134 beds.

Fellowships and Scholarships.—Fellowships, Scholarships, and prizes of over £1000 are awarded annually. There are also numerous Entrance Scholarships. Particulars may be obtained on application.

The following Prospectuses may be obtained on application to the Registrar:—Medical Faculty, School of Tropical Medicine, School of Dental Surgery, School of Veterinary Science, and Diploma in Public Health.

J. S. MACDONALD, M.A., F.R.S.

UNIVERSITY of ABERDEEN

Founded 1494.

FACULTY OF MEDICINE.

THE Degrees in medicine granted by the University are—Bachelor of Medicine, Bachelor of Surgery, Doctor of Medicine, and Master of Surgery. They are conferred only after Examination, and only on Students of the University. Women are admitted to instruction and graduation on the same footing as men. A Diploma in Public Health is conferred after Examination on Graduates in Medicine of the University of Aberdeen, or of any University whose medical degrees are recognized as qualifying for registration by the General Medical Council of the United Kingdom. The Faculty of Medicine embraces twelve chairs, from which instruction is given in all the main branches of Medical Science.

Practical Classes in connection with these chairs are conducted by the Professors and Assistants in Laboratories furnished with all the necessary appliances; and opportunities are afforded to Students and Graduates to extend their practical knowledge and engage in original research.

Instruction is also given in special departments of Medical Practice by Lecturers appointed by the University Court.

Clinical instruction is obtained in the Royal Infirmary, Royal Lunatic Asylum, the Sick Children's Hospital, the City (Fever) Hospital, the General Dispensary, Maternity Hospital and Vaccine Institutions, and the Ophthalmic Institutions.

Bursaries, Scholarships, Fellowships and Prizes, to the number of 50 and of the Annual Value of £1183, may be held by Students in this Faculty.

The cost of Matriculation, Class and Hospital Fees for the whole curriculum, inclusive of the fees for the Degrees, is usually about £160. The raising of fees is at present under consideration: they may be raised by about 50 per cent next academical year.

A Prospectus of the Classes, Fees, &c., may be had on application to the Secretary of the Faculty of Medicine.

H. J. BUTCHART, Secretary.

Royal College of Surgeons of Edinburgh

FOUNDED 1505.

Copies of the Regulations for the Fellowship, Licence, and Licence in Dental Surgery, with dates of Examinations, Curricula, etc., for the year 1921, are now ready, and may be had on application to—

D. L. EADIE, 49 LAURISTON PLACE, EDINBURGH, Clerk of the College.

Medical Defence Union,

INCORPORATED 1885.

LIMITED,

Registered
Offices: **4 Trafalgar Square, Strand, W.C.2.**

President
SIR CHARLES BALLANCE, K.C.M.G.,
C.B., M.V.O.

Hon. Treasurer:
SEYMOUR TAYLOR, M.D., F.R.C.P.

General Secretary: JAMES NEAL, M.R.C.S., L.R.C.P.

THE OBJECTS OF THE UNION ARE AS FOLLOWS:

- I.—To support and protect the character and interests of Medical Practitioners practising in the United Kingdom.
- II.—To promote honourable practice, and to suppress or prosecute unauthorized practitioners.
- III.—To ADVISE and DEFEND or assist in defending Members of the Union in cases where proceedings involving questions of professional principle or otherwise are brought against them.

TERMS OF MEMBERSHIP.—The Annual **SUBSCRIPTION** is **£1**, payable on JANUARY 1ST OF EACH YEAR, with an **entrance fee of 10s.** payable on joining the Union. The Member has also to guarantee a certain sum (not less than £1) which forms the extent of his liability. Newly registered medical practitioners are admitted to membership without payment of an Entrance Fee, provided they join the Union within one year of the date of their Registration. A Member elected on or after 1st July in any year is only required to pay half the current subscription for that year. The privileges of a Member are personal to himself.

The **Guarantee Fund exceeds £11,000**, and is available should any occasion require its being called up, but up to the present time all claims for administration, legal, and other costs have been defrayed out of income.

Application Forms, Copies of last Report, and any other information can be obtained by applying to the Secretary at the Registered Offices.

LABORATORIES OF PATHOLOGY AND PUBLIC HEALTH

**6 Harley
Street,
LONDON, W. 1**



Telephone: Mayfair 1434.
Telegrams: "Clinician
Wesdo, London."

CLINICAL INVESTIGATIONS OF ALL KINDS undertaken for
MEDICAL PRACTITIONERS, SANITARY AUTHORITIES, &c.

DEPARTMENTS—

**ANALYTICAL
BACTERIOLOGICAL
HISTOLOGICAL**

**PATHOLOGICAL
PUBLIC HEALTH
VACCINES**

Culture media supplied.
All Reports issued by
Experts.

Apparatus for Transmission of Specimens.
NO MEMBERSHIP SUBSCRIPTION.

G. L. EASTES, M.B., B.Sc.

The London and Counties Medical Protection Society

(FOUNDED 1892.)

LIMITED.

Registered Offices: 32 Craven Street, Strand, W.C.2

Telegrams:
"MEDICAVERO WESTRAND, LONDON."

Telephone:
CENTRAL 5098.

President:

SIR JOHN ROSE BRADFORD, K.C.M.G., C.B., M.D., F.R.C.P., F.R.S.

Trustees for the Reserve Fund:

SIR R. DOUGLAS POWELL, BART., K.C.V.O., M.D., F.R.C.P.

SIR JAMES REID, BART., G.C.V.O., K.C.B., M.D., F.R.C.P.

SIR JOHN TWEEDY, LL.D., F.R.C.S.

PRINCIPAL OBJECTS.

To protect, support, and safeguard the character and interests of legally qualified Medical and Dental Practitioners; to advise and assist Members of the Society in matters affecting their professional character and interests; and to indemnify them in regard to actions, etc., undertaken on their behalf.

INDEMNITY AGAINST DAMAGES.

Members of the London and Counties Medical Protection Society are not only indemnified against the cost of defending or conducting actions undertaken on their behalf by the Society, whether as plaintiffs or defendants, but are also, subject to the provisions of the Articles of Association, indemnified, up to £3,000 in any one year for any one Member, against the damages and costs of the other side which may be awarded against them in cases which the Society has defended or conducted on their behalf, but in which it has not been successful.

Provision has been made for the latter purpose of an available sum of £24,000 per annum.

IMPORTANT NOTICE.

The Society is subject to no control by its Underwriters or by any other outside body in the conduct of its business or in the matter of appeal. The management of the cases referred to the Society rests entirely with the Council.

Entrance Fee, 10/-. Subscription, £1 per annum.

On the 30th June, 1920, the Invested Funds of the Society, taken at their market value as on the 1st January, 1920, amounted to £26,800.

Forms of Application for Membership and full particulars can be obtained from—

The Secretaries, 32 CRAVEN STREET, STRAND, LONDON, W.C.2

SWEDISH Institute & Clinique

*For MEDICAL GYMNASTICS,
MASSAGE and ELECTRICITY,*

106 & 108, Cromwell Road, London, S.W.7.

FOUNDED 1904.

THE courses of training extend over fifteen months or two years, and include instruction in all subjects required by the syllabus of the best Swedish Schools, with the addition of Medical Electricity, which is not included in Sweden. Students are prepared for the Examinations in Massage, Swedish Medical Exercises, and Electricity of the Chartered Society of Massage and Medical Gymnastics. Separate Classes for Men in all the above subjects.

The training also includes practical work in the Out- and In-Patient, Electrical and Orthopaedic Departments of St. Bartholomew's Hospital, St. Mary's Hospital, the Royal Free Hospital, as well as in the Institute Clinique for poor patients.

No difficulty has been experienced in finding private and hospital work for qualified Students. Special terms will be made for Nurses. Resident and Non-Resident Pupils received.

CERTIFICATE FOR TEACHERS.—A second year's training is compulsory for Students wishing to qualify as Teachers, and Candidates are prepared for the Teacher's Diploma of the Chartered Society of Trained Masseuses.

Second year Students not wishing to be trained as Teachers can be trained as Secretaries and X-Ray Assistants to Medical Men.

Sessions :—JANUARY, APRIL, SEPTEMBER, and DECEMBER.

SPECIAL COURSES.

SCHOOL OF MEDICAL ELECTRICITY.—Courses of training in preparation for the Examination in Medical Electricity of the Chartered Society of Massage and Medical Gymnastics are held throughout the year. Practical work in the Electrical Department of St. Mary's and Royal Free Hospitals. Post graduate Classes in X-Ray and Electricity.

— *Established 1899.* —

MENDIP HILLS SANATORIUM

HILL GROVE, WELLS, SOMERSET.

OPEN-AIR TREATMENT OF CONSUMPTION.

Specially built, facing South. Extent of Sanatorium Grounds 300 acres—meadow and woodland. Sheltered pine avenues. Altitude 862 feet, magnificent views for miles South. Hotwater Radiators and Electric Light. Continuous Inhalation and Electric Treatment. Graduated Exercises. Trained Nurses.

Resident Physician: DAVID C. MUTHU, M.D., M.R.C.S., L.R.C.P.

Author of "PULMONARY TUBERCULOSIS AND SANATORIUM TREATMENT";
a Record of Ten Years' Observation and Work in Open-air Sanatoria, etc.

Terms: 5 Guineas Weekly.

Apply SECRETARY.

NERVES TREATED.

BEAUWORTH MANOR,

**ALRESFORD,
HANTS.**

PRIVATE COUNTRY RESIDENCE FOR INVALIDS AND OTHERS under the care of a Resident Medical Man. Farming, Gardening, Riding, Motoring; all indoor and outdoor occupations and amusements. Any case received except insanity. The House for Rest and Quiet, standing in 400 acres, right in the country. With electric light and every modern convenience.

Apply SUPT., BEAUWORTH MANOR, ALRESFORD, HANTS.

Superintendent is Fellow of Royal Society of Medicine, and Member of British Medico-Psych. Assoc., etc.

**REFERENCES FROM
MEDICAL PROFESSION.**

ST. LUKE'S HOSPITAL

ESTABLISHED 1751.

Private Nursing Staff Department.

TRAINED NURSES for **Mental and Nervous Cases** can be had immediately. Apply to Lady Superintendent, 19, Nottingham Place, London, W.1.

Telephone : Mayfair 5420. Telegraph : "Envoy, Barker, London."

Northern Branch.—Apply, Lady Superintendent, 57 Clarendon Road, Leeds.

Telephone : Leeds 26165.

THE CHARTERED SOCIETY OF MASSAGE AND MEDICAL GYMNASTICS.

INCORPORATED by Royal Charter, June 9th, 1920, and amalgamating the Incorporated Society of Trained Masseuses and the Institute of Massage and Medical Gymnastics. The Chartered Society has been formed for the purpose of affording protection to the Profession of Massage and to its registered members :

- By improving the training and status of masseuses and masseurs.
- By providing and supervising independent examinations.
- By setting up Registers of persons qualified to practise.
- By arranging post-graduate courses, lectures, and conferences.
- By supplying work for members (under Registry regulations) and
- By working in all ways for the advancement and general welfare of the profession.

Registration with the Chartered Society is open to all certificates-holders of the Incorporated Society and of the Institute. Test examinations will be set up for the benefit of masseuses and masseurs of experience, holding certificates other than the above-mentioned, who wish to register with the Chartered Society. Forms of application for registration and all information can be obtained from the offices of the Society.

The Society is approved by the Medical Profession, and its Certificate Holders may not undertake cases without the permission of a registered medical practitioner.

The Certificate of the Society is a qualification accepted by the Admiralty, the War Office, and the Ministry of Pensions, and over 3000 certificate-holders are at present working in Naval, Military and other Hospitals, at clinics and treatment centres.

For further information apply to the Secretary :—

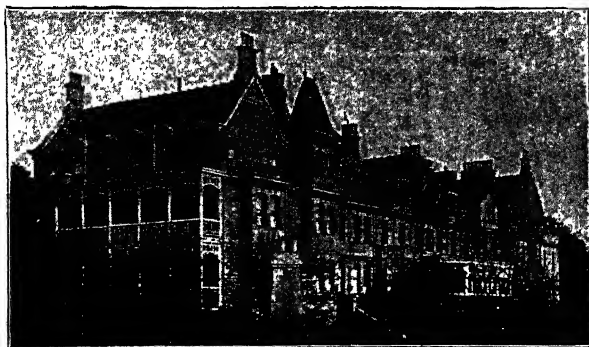
MISS E. M. TEMPLETON, 157 Great Portland Street, LONDON, W.1.

Lansdown Grove house,

[Electric Lift.]

BATH.

[430 ft. above Sea.]



Has special
arrangements for
RHEUMATIC
: and :
ARTHRITIC
PATIENTS.

BATHS,
ELECTRIC AND
PHYSICAL
TREATMENT,
X RAYS,
RADIUM WATER
(3000 Maché
units per litre.)

— ARRANGEMENTS FOR ALL CLASSES. —

FULL PARTICULARS ON APPLICATION TO LADY SUPERINTENDENT.

— THE —

Norfolk Sq. Nursing Association and Hyde Park Association.

Telegrams: NURSENTAL.

Telephone: Paddington 2467 & 6533.

For the supplying of Fully-trained Medical,
Surgical, Maternity, and Mental Nurses;
also for Nervous and Massage Cases ::

Apply to Miss JEAN HASTIE, SUPERINTENDENT,
49, NORFOLK SQUARE, LONDON, W.2.

Telephone : Paddington 2437.
Telegrams : "Assistiamo, London."

MALE NURSES' ASSOCIATION

— 29 York Street, —
Baker Street, London, W.1

Established 20 years.

Permanent Staff of Resident Male Nurses.

We supply fully trained male nurses for all cases. Thoroughly experienced men with special training for mental work. Masseurs supplied for town or country.

W. J. HICKS, *Secretary,*

Telephone : Paddington 2437.
Telegrams : "Assistiamo, London."

MEDICAL, SURGICAL, and MENTAL NURSES

MALE OR FEMALE.

Our Nurses are chosen carefully, for their personal character, and their suitability for private work. They reside on the premises, and are available for urgent cases Day or Night.

(Mrs.) MILLICENT HICKS, *Superintendent.*
W. J. HICKS, *Secretary.*

THE NURSES' ASSOCIATION

(In conjunction with the MALE NURSES' ASSOCIATION),

— 29 York Street, —
Baker Street, London, W.1

THE NEW
Mental Nurses' Co-operation

139 EDGWARE ROAD, MARBLE ARCH, W.

Specially trained Nurses for Mental and Nerve Cases supplied immediately. All Nurses are insured under the Employers' Liability Act of 1906.

Telegrams: "Psyconurse, Edge, London."

Telephone: Paddington, 6105:



APPLY THE
 SUPERINTENDENT.

The CURE OF STAMMERING.

Mr. A. C. SCHNELLE receives a limited number of resident pupils for the treatment of stammering. Those unable to reside, attend for instruction daily if convenient. Mr. Schnelle is as successful with adults as with boys and girls.

Enquiries are invited, or interviews can be arranged at his residence,

119 Bedford Court Mansions, Bedford Avenue, London, W.C. 1

'Phone: MUSEUM 285.

ESTABLISHED 16 YEARS.

LIP-READING. SPEECH FOR THE DEAF

LESSONS GIVEN TO PERSONS WHOLLY OR
 PARTIALLY DEAF, BY MISS BOULTBEE.

Write for appointment—

125b St. James's Court, Buckingham Gate, London, S.W.1

RESIDENTIAL SCHOOL for Blind, Delicate, and Backward Children.

THEY are thoroughly well cared for and trained by Educational Specialist in methods employed in the Teaching of the Blind. Special Department for Children suffering from *partial blindness or defective sight*. Pupils taught by special methods and with special apparatus by means of which children are taught to make the *best use of and to economise the limited vision they possess*. The School is situated in beautiful locality, and has a nice garden; is near to sea and within easy reach of beautiful country. This School holds Board of Education's Certificate for efficiency, and is the only one of its kind in the kingdom.

The Secretary, Brooklands, Upper Maze Hill, ST. LEONARDS-ON-SEA.

STOKE PARK COLONY

STAPLETON, BRISTOL,



and Ancillary
Institutions.

1578 PATIENTS OF BOTH SEXES

(Not exceeding 910 Females or 718 Males).

Managers: The Incorporation of National Institutions
for Persons requiring Care and Control (Class A).

A Small FARM and GARDEN SCHOOL

HAS BEEN OPENED AT THE

GREY HOUSE, SEVENOAKS

For Nervous, Backward, or
Delicate Girls.



A few Ladies also
received.

THE School is intended for Girls of gentle
birth whose parents or guardians find
themselves unable to pay the usual high fees.

— INDOOR OCCUPATIONS TAUGHT. —

For Terms apply

MRS. PEARCE CLARK.

The EMPIRE NURSING HOME

AN IDEAL NURSING HOME.

Accommodation—42 Private Rooms.

Prices: 7 to 17 guineas.

Theatre Fee from 2 guineas.

Separate theatre floor—two theatres,
anaesthetising room & sterilising rooms.
Large lift to all floors, separate food
lift. Qualified Dispenser in charge of
dispensary on the premises. Only fully
trained Sisters and Nurses under Lady
Superintendent. Light system instead
of be-
insuring silence on the corridors

Any physician, surgeon, or general
practitioner may send his patients to
the Home, and patients are attended in
all cases by their own doctors.

Full information as to Terms, etc., will
gladly be given on application to—

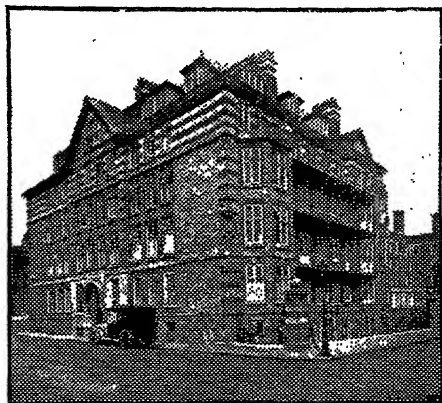
The Lady Superintendent,

EMPIRE NURSING HOME,

Vincent Sq., Westminster, S.W.

Telegrams: Emphostal, Sowest, London

Telephones: Victoria 1714 & 1715.



Convalescent Home NEW BRIGHTON for Women and Children.

Hon. Secretary and Treasurer: R. C. LINDSAY, 5, Fenwick Street, Liverpool.

Honorary Medical Officers:

CHAS. WILSON, M.B. & C.M. (Glas.); A. MOSCROP WALKER, L.S.A. (Lond.);

H. BUXTON, M.D. (Durh.).

Hon. Dental Surgeon: ARTHUR GAPPER, L.D.S., R.C.S. (Edin.).

Lady Superintendent: Miss L. REED.

THE HOME is open all the year round for the reception of patients recovering from illness, or requiring rest and change at the seaside.

During the winter months the whole building is well warmed by an efficient heating apparatus, and thus the Home is made a pleasant Residence for Delicate Persons even in the most severe weather, and a beneficial resort in the winter as well as in the summer.

The House is built on the shore, by the new Promenade, and within a few minutes' walk of the Landing Stage and Railway Station.

There is a special department for Gentlewomen. Each Lady has a separate bedroom.

An Annual Subscription of One Guinea entitles the Subscriber to nominate at reduced rates.

BAY VIEW MOUNT, PAIGNTON, S. DEVON.

A Private Nursing Home FOR *Convalescents & Chronics*

Ladies and Gentlemen. Every home comfort.
Highest references. : : Trained Nurses.

For Terms apply - - LADY SUPERINTENDENT.

"COLLINGWOOD," CHELTENHAM SPA.

A Refined Nursery Home for CHILDREN of any age up to seven years. Very limited number taken, home sympathies, freedom, and care. FEES: 2½ guineas weekly. Highest references.

PROSPECTUS ON
APPLICATION.



MISS DUTTON (Higher Certificate N.F.U.).
MISS ADAMSON (Qualified Hospital Nurse).

ST. LEONARD'S-ON-SEA.

Special Residential School (Board of Education Certificate), for the Development, Training, and Education of Abnormal Children. There is also a **Home for Senior Girls** over school age. **Select Home for Backward Senior Girls** in separate house and grounds. The aim of the Principal is to meet the urgent need of the Children of middle- and better-class people at moderate fees.

For further particulars apply to **Mrs. MEIKLEJON,**

St. Paul's House, & 12 Upper Maze Hill, ST. LEONARD'S-ON-SEA.

HOME FOR FEEBLE-MINDED, THE ROYAL ALBERT INSTITUTION, LANCASTER.

The ROYAL ALBERT INSTITUTION is a Home for the Care, Education and Training of the IMPROVABLE FEEBLE-MINDED, with accommodation for 750 cases. Certified under the Mental Deficiency Act for 461 males and 289 females.

Terms: 1. PRIVATE PATIENTS of either sex are admitted from any part of the country at rates varying from 80 to 250 guineas per annum. Full particulars on application.

2. APPLICANTS resident in the associated area of the Seven Northern Counties of England, for whom the full rate of 80 guineas cannot be offered, may be admitted either free by election, or at reduced rates ranging from 40 guineas per annum upwards. Election candidates must be between six and fifteen years of age.

BRUNTON HOUSE: A Private Establishment for Males.

BRUNTON HOUSE combines home comforts with all the advantages of a large Institution under responsible management. It is easily accessible from Lancaster, overlooks Morecambe Bay, and possesses extensive gardens and grounds, with tennis and croquet lawns. Varied scholastic and manual instruction. Individual attention is given to the pupils by an experienced staff under the Medical Superintendent and Resident Matron.

SAMUEL KEIR, *Secretary.*

EPILEPSY. THE DAVID LEWIS COLONY.

Solely for the benefit of Sane Epileptics; stands in its own grounds of nearly 180 acres, and is situated in a beautiful part of Cheshire, two and a half miles from Alderley Edge Station, and fourteen miles from Manchester. Electric light throughout. Perfect Sanitation. The Colony system ensures for Epileptics the social life and employment best suited to their needs.

TERMS, FOR MIDDLE AND UPPER CLASS PATIENTS FROM 42s. A WEEK UPWARDS, according to accommodation and requirements.

For further information apply to the MEDICAL SUPERINTENDENT, Warford, near Alderley Edge, Cheshire.

School for Epileptic Boys.

COLTHURST HOUSE, WARFORD, ALDERLEY EDGE.

Under the Management of the Committee
—of the David Lewis Colony.—

Home life, Medical care, and suitable education for boys subject to Epilepsy. Terms 42s. weekly.

Further particulars may be obtained from the MEDICAL SUPT., The Colony, ALDERLEY EDGE.

The Co-Operative Sanatorium For EPILEPSY and MENTAL DEFECT.

A PRIVATE INSTITUTION certified under the Mental Deficiency Act, on a profit-sharing basis, in a delightful rural part of Essex, for 56 Gentlemen suffering from Epilepsy or Mental Defect, not needing Asylum treatment. INCLUSIVE TERMS. From 32/8 weekly upwards.

Apply SECRETARY, NEW LODGE, BILLERICAY, ESSEX.

"NORMANSFIELD."

A PRIVATE ESTABLISHMENT for the care and training of the
MENTALLY DEFICIENT.

Patients of either sex, including quite young children, received. Separate houses for the slighter grades of defect.

For Particulars apply to the Resident Physician & Proprietor, HAMPTON WICK.

VALE OF GLWYD SANATORIUM

THIS Sanatorium is established for the Treatment of
TUBERCULOSIS OF THE LUNGS & PLEURAL CAVITIES.

It is situated in the midst of a large area of park land at a height of 450 feet above sea level, on the south-west slopes of mountains rising to over 1800 feet, which protect it from north and east winds and provide many miles of graduated walks with magnificent views.

Fully trained Nurses. Nurse on duty all night. X-Ray Apparatus newly installed. Every facility for treatment by Artificial Pneumothorax.

Electric Lighting in each room. Heating by hot water radiators.
Medical Superintendent: H. MORRISTON DAVIES, M.D. (Cantab.), F.R.C.S.

For particulars apply to—

Medical Superintendent,
 Llanbedr Hall, Ruthin, N. Wales.

Wensleydale Sanatorium

**FOR THE OPEN-AIR TREATMENT
 OF CHEST DISEASES.**

TERMS . . . £2 : 16s. per week inclusive.

THIS SANATORIUM is situated in AYSGARTH, YORKSHIRE; a district celebrated as a Holiday Resort for its beautiful scenery, pure, dry and bracing atmosphere.

It stands in three acres of ground 800 feet above sea level, and is absolutely remote from manufacturing districts. Tuberculin is employed in suitable cases.

*Physicians—*D. DUNBAR, M.B., B.S.
 W. N. PICKLES, M.D., B.S.

Address—

THE SECRETARY, Wensleydale Sanatorium, Aysgarth, S.O., YORKSHIRE

LEYSIN-FEYDEY, SWITZERLAND.

5000 FEET ABOVE SEA LEVEL RHONE VALLEY 2 HOURS RAIL FROM LAUSANNE

Four thoroughly up-to-date Sanatoria for the treatment of **Pulmonary Tuberculosis**. Sheltered and sunny situation. Typical Alpine Climate. Magnificent view. Delightful walks.

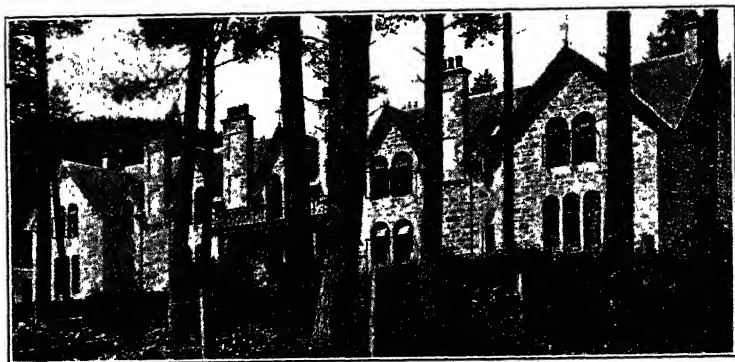
During the war **Leysin** was the **Chief Station** in Western Switzerland for **English, French and Belgian Soldiers** suffering from tuberculosis. **English speaking Doctors. English and Catholic Churches.**

INCLUSIVE TERMS APPLY TO:

"Manager," Sanatorium-Grand-Hotel, LEYSIN-FEYDEY, sur Aigle.

The GRAMPIAN SANATORIUM

KINGUSSIE, N.B.



SITUATED in the Upper Speyside district of Inverness-shire. One of the highest inhabited districts in Britain. "The Switzerland of the British Isles." Bracing and dry mountain climate; well sheltered. Sanatorium specially built for the Open-Air Treatment of Tuberculosis. Opened in 1901. Elevation nearly 900 ft. above sea level. Electric light throughout buildings and in rest shelters. All forms of treatment available.

Terms :
6 Guineas Weekly.

For particulars apply:

Dr. FELIX SAVY, Medical Superintendent,
(Late Tuberculosis Specialist, Aldershot Command.)

THE

Home Sanatorium

WEST SOUTHBOURNE, Nr. BOURNEMOUTH

FOR PULMONARY TUBERCULOSIS. Suitable climate Winter and Summer. Skilled Nursing Staff, including Night Nurse. Sun Baths and Sea Bathing. Ten acres beautifully timbered grounds. Croquet and Billiards. Charges: 6 guineas weekly. For illustrated Prospectus and full particulars apply to

J. E. ESSLEMONT, M.B., Ch.B., *Resident Supt.*

Telegrams: "Sanabilis, Bournemouth."

Telephone: 61 Southbourne.

CRIPPLES.

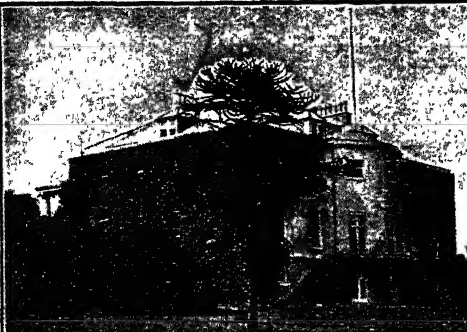
St. VINCENT'S OPEN-AIR HOSPITAL and SCHOOL for CRIPPLED BOYS.

Tel. Pinner 50]

EASTCOTE, PINNER, MIDDLESEX.

[Founded 1907

A RESIDENTIAL SCHOOL AND HOSPITAL for boys suffering from tubercular and other joint diseases, infantile paralysis, etc. Certified by Ministry of Health, Board of Education, and Home Office, 115 beds. *Hon Surgs:* Sir ROBERT JONES, K.B.E.; D. McCRAE AITKEN. *Hon. Phys.:* D. M. BARCROFT. *Hon. Med. Off.:* LIONEL W. HIGNETT. *Corres. Manager:* Rev. R. B. FELLOWS.



Norwood Sanatorium Ltd.
 FOR THE TREATMENT OF
 ALCOHOLISM and other
 . . . DRUG HABITS.
 Under an Advisory Committee
 of influential Medical Men.

THE MANSION, Beckenham Park, Kent.
 Telegrams—Noratorium, Beckenham.
 Telephone—Bromley 648.
 For Illustrated Prospectus, etc., apply to FRANCIS HARE, M.D., Med. Supt.

Treatment for Alcoholic Subjects.

BOARDING facilities are offered at a comfortable Farm House in Island of Tírree (West Highlands) for Gentlemen addicted to Alcohol. The Island is entirely free from all drinking facilities. Comfortable home; good references.

All information and terms from James B. Thomson, 2 Eden Terrace, Morningside, Edinburgh.

THE WORCESTERSHIRE Brine Baths Hotel

(ADJACENT TO THE MODERN ST. ANDREW'S BRINE BATHS.)

WINTER HEALTH RESORT.

DROITWICH.

150 ROOMS.

Several Suites, and many
 South Rooms, also Bed-
 rooms on Ground Floor.

ONLY HOTEL WITH LIFT.

NEW SMOKING LOUNGE.

LIBRARY
 BILLIARDS
 NIGHT PORTER.

*Beautiful Drives,
 Walks and Excursions.*

GOLF LINKS, TENNIS,
 CROQUET,
 GARAGE FOR MOTORS
 with Lock-ups.

OFF. appt. of A.A. & R.A.C.



TABLE D'HOTE DINNER AT SEPARATE TABLES, 7 P.M.

Moderate Inclusive Terms. Special advantages to Medical Men in Practice, also Army and Navy Officers Invalided from the War.

Telegrams: "Worcestershire Hotel, Droitwich."

WRITE FOR ILLUSTRATED PROSPECTUS.

Telephone: No. 2 Office.
 " " 48 Visitors.

R. P. CULLEY & CO. Ltd., Proprietors.

T. K. CULLEY, Manager.

INEBRIETY Alcohol and Drug Abuse.

Dalrymple House, RICKMANSWORTH, HERTS.

Established 1883, by an Association, no member of which derives any pecuniary profit from the undertaking.



For the Treatment of Gentlemen, under the Act and Privately.

LARGE Grounds on the bank of the river Colne. Gravel Soil. Outdoor and indoor recreations and pursuits. Half hour by train from London.

Telephone: 16 Rickmansworth. Telegrams: Cedars, Rickmansworth.

Apply to DR. F. S. D. HOGG, Resident Medical Superintendent.

HOMES FOR INEBRIATE WOMEN

The Church of England Temperance Society's Institutions for those with slender means.

HAMOND LODGE, TERRINGTON ST. CLEMENT, KING'S LYNN, NORFOLK.

Terms: Drawing-Room, £3 3s. 0d. and £2 2s. 0d.; Work-Room, £1 1s. 0d. Kitchen, 10s. 6d. weekly.

TEMPLE LODGE, TORQUAY.

Terms: Drawing-Room, £3 3s. 0d. and £2 2s. 0d.; Work-Room, £1 1s. 0d.; Kitchen 10s. 6d. weekly.

No Patient received for less than Twelve Months. No Patient over Fifty Years of Age admitted except by special permission of the Committee.

Applications for Forms and Particulars to

Rev. C. F. TONKS, Secretary, Church of England Temperance Society
50 Marsham Street, Westminster, S.W.1. (Incorporated).
Telephone: VICTORIA 562.

INEBRIETY.

HOMES FOR LADIES.

Voluntary or under the Act.

ASHFORD, Middlesex.



14 Miles from London.

BEAUTIFUL Residence, standing in its own grounds, 50 acres in extent. Large Farm and Dairy. R.C. Chapel on the Estate. TERMS: 25/- to 6 guineas weekly.

For Particulars apply to the Mother Superior.

PEEBLES The Ideal Inland Health Resort ::

Trout and Salmon Fishing on the Classic Tweed.
Municipal Golf Course, Municipal Tennis Court.
Salubrious Climate, Beautiful Scenery and Walks.
Fine Motoring Roads. :: Public Parks and
Children's Playgrounds.

Illustrated Guide Book Free from the Town Clerk, Peebles.

SOUTHPORT (Birkdale Park).

Smedley Hydropathic Establishment

HIGHEST AND MOST BRACING SITUATION.

Physician: JOS. G. G. CORKHILL, M.D.

RUSSIAN, TURKISH, AIX, NAUHEIM, AND
ALL OTHER BATHS.

For Prospectus, apply to the Manageress.

Telegrams: Smedley, Southport.

Telephones: 22 Birkdale, Visitors.
37 31 Management.

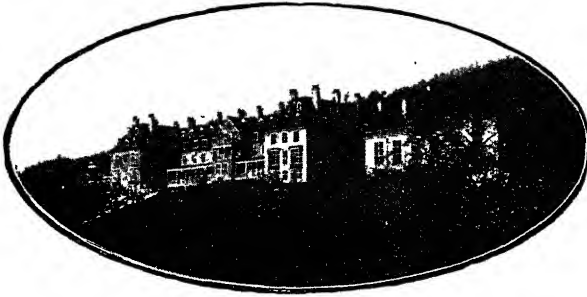
The City Hydropathic and Massage Establishment . .

Most successful treatment for Arthritis, Nerve
Trouble, Sciatica, Lumbago, Neuritis, Gout,
and all kinds of Sprains and Bruises. . .

275 Broad St. (Opposite Prince of Wales Theatre), **BIRMINGHAM.**

Telephone: MIDLAND 216. Proprietor: ROBERT SCHENKEL (Swiss), Masseur.

PEEBLES HOTEL HYDROPATHIC.



A CONTINENTAL SPA IN SCOTLAND UNDER ONE ROOF.

Situated amidst the most charming scenery in Peeblesshire.
700 feet above sea level. A complete equipment of all Modern Baths.

Fango Di Battaglia (Volcanic Mud Packs for Gout, Rheumatism,
Lumbago, Sciatica, etc. Radium Emanations.)
NAUHEIM BATHS & SCHOTT EXERCISES. WEIR-MITCHELL TREATMENT.
TURKISH BATHS; RUSSIAN BATHS. VICHY & AIX-LES-BAINS DOUCHES

ELECTRIC LIGHT BATHS, ✱ PLOMBIÈRES TREATMENT.
DOWSING RADIANT HEAT.

— AACHEN FRENKEL SYSTEM FOR LOCOMOTOR ATAXY. —

RADIUM EMANATIONS. BERGONIE TREATMENT OF OBESITY.

— BRINE BATHS; SULPHUR BATHS; PINE BATHS —
SINUSOIDAL, HIGH FREQUENCY AND X-RAY TREATMENT.
FOUR-CELL ELECTRIC BATH; INHALATIONS. STATIC ELECTRICITY.
— ELECTRIC VIBRATION, SPECIAL DIETING. —
EXPERT MASSEUR: MASSEUSE; NURSING SISTER.

Every comfort for INVALIDS and the CONVALESCENT.
Sheltered Balconies, Wind Screens, and Open-Air Air Chalets.

Physician :

K. R. COLLIS HALLOWES, M.B., B.Ch., B.A.O., B.A. (Univ. Dublin).

GOLF.—Excellent 18-hole Course within 15 minutes' walk.

Croquet, Tennis, and Bowling Greens. Delightful Grounds.

Every Form of Indoor and Outdoor amusement. Garage.

For *TERMS and PROSPECTUS* apply to the

MANAGER, PEEBLES, N.B.

THE
Radium Institute,
Riding House St., W.1

Patron:
 HIS MAJESTY THE KING

Presidents:
 THE RT. HON. THE EARL OF IVEAGH, K.P., G.C.V.O., LL.D., F.R.S.
 THE RIGHT HON. SIR ERNEST CASSEL, P.C., G.C.B., G.C.M.G., G.C.V.O.

Chairman of Committee:
 SIR FREDERICK TREVES, BART., G.C.V.O., C.B., LL.D.

Medical Superintendent:
 A. E. HAYWARD PINCH, F.R.C.S.

THE Institute was established in 1911 for the Treatment of Patients by Radium, and for Researches into the Therapeutic Properties of Radium and Radio-Active Substances.

Both paying and necessitous patients are treated, but no case is received except on the introduction of the patient's Medical Attendant.

Tubes and Plates containing Radium Emanation are supplied to Medical Practitioners at moderate charges.

The Institute undertakes the estimation of the activity of Radium and Radio-Active Substances, the measurement of Radium Salts, and the preparation of Radium Applicators.

THOMAS A. GARNER, F.C.I.S., *Secretary.*

DOWSING RADIANT HEAT TREATMENT.

Proved to be the most valuable application of all Physical and Electrical Treatments.

Luminous Radiant Heat is used in the Treatment of—

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Stiff and Painful Joints, Scleritis, certain forms of Partial Paralysis. 2. Functional Disorders of the Liver, Stomach, and Kidneys. 3. Gout, Rheumatism, Rheumatic Gout, Lumbago. | <ol style="list-style-type: none"> 4. Nervous Exhaustion and General Debility from worry and overwork. 5. Scrofula and Glandular Affections. 6. Anemia (poverty of blood). 7. Chronic Bronchitis, Malaria, and Phthisical Affections. |
|---|---|

8. Pneumonia, Nephritis, and cases of a similar character.

Branches and Licences in all important Towns. Apparatus supplied on hire to Medical Men, Nurses, Hospitals, and Medical Institutions. Full particulars and pamphlets post free on application to the Chief Institution.

THE DOWSING RADIANT HEAT COMPANY, LTD., 91 & 93 Baker Street, LONDON, W.1.

Telephone—Nos. 1573-1571 May fair.

Telegrams—"Radiotherm," London.

BRIDGE of ALLAN MINERAL WELLS

THE BRIDGE OF ALLAN WATER is a true saline, and is pumped up from deep springs.

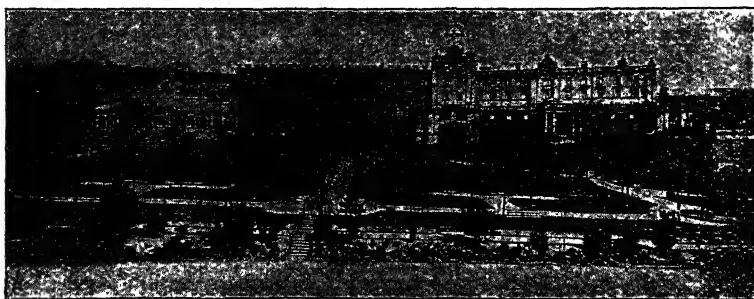
The Chief Ingredients are Salts of Calcium, Sodium, and Magnesium. The water is clear, odourless, and has a not unpleasant Saline taste.

These waters are employed internally and as baths.

Being tonic and eliminative they are specially useful in Gout and Rheumatism, in Stomach and Bowel troubles, in dry skin diseases, and in cases of Bad Circulation with Chilblains.

In cases of "Liver" & "Biliousness" also these waters are most helpful.

An illustrated Guide to Bridge of Allan, containing full particulars as to the Waters, will be supplied free on application to the Town Clerk.



SMEDLEY'S

Hydropathic Establishment,

MATLOCK.

ESTABLISHED 1853.

Physicians: { G. C. R. HARBINSON, M.B., B.Ch., B.A.O., (R.U.I.).
 R. MACLELLAND, M.D., C.M. (Edin.), *resident*.

A COMPLETE SUITE OF BATHS, including separate Turkish and Russian Baths for Ladies and for Gentlemen, Aix Douches, Vichy Douche, and an Electric Installation for Baths and Medical purposes.

DOWSING RADIANT HEAT

D'ARSONVAL HIGH FREQUENCY

RONTGEN X-RAYS

NAUHEIM BATHS

Special provision for Invalids. Milk from own Farm. American Elevator. Electric Light. Night Attendance. Rooms well ventilated, and all Bedrooms warmed in Winter throughout the Establishment. Large Winter Garden. Extensive Pleasure Grounds. Matlock Golf Links, 18 holes, within 15 minutes' walk.

MASSAGE & WEIR-MITCHELL METHODS OF TREATMENT.

A Large Staff (upwards of 60) of Trained Male and Female Nurses, Masseurs, and Attendants.

Prospectus and full information on application to

H. CHALLAND, Managing Director

Telegrams: "SMEDLEY'S, MATLOCK."

Telephone No. 17.

CRAIGLANDS HYDRO,

ILKLEY.

Telegrams:
"Craiglands,
Ilkley."

Telephone:
308 and
303.



Prospectus
on
application
to the
Manager.

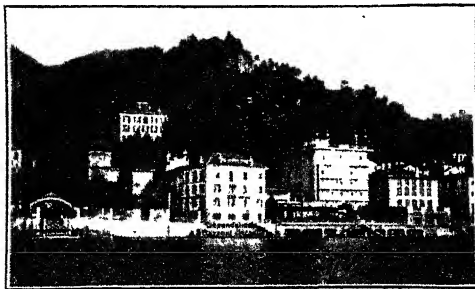
Resident Physician:

MAURICE R. DOBSON, O.B.E., M.B., B.S. (Lond.), L.R.C.P., M.R.C.S. (Eng.)

THE most popular Hydro in the district. Established over half a century. Accommodates 200 visitors. Thorough Hydropathy, complete suites of Baths, including Turkish and Russian. Magnificent Ball room, Promenade Corridor, splendid Amusements, elegant Smoke room, superb Billiard room (3 tables), pleasant Drawing room, Reading and Writing room, etc. Lovely Grounds, 7 acres. 3 Tennis Courts, Bowling and Putting Greens.

Terms: £4 10s. 6d. to £5 5s. per Week. According to Season.

TREMEZZO, LAKE OF COMO, ITALY.



**HOTEL BAZZONI ET DU
LAG VILLA ERMINIA,
BELVEDERE,**
and other Dependencies.

Large park and gardens, private baths, Spring and Autumn season. Lift, central heating, electric light. Own Spring Water. Post and Telegraph Bureau and Bank in the Hotel. Motor boat, garage. Pension. Moderate charges.

OPEN THE WHOLE YEAR.
EVERY ENGLISH COMFORT.



C. ALFRED BOLIS, Proprietor
For many years in London.

STRATHPEFFER SPA

*In the midst of the
Highlands.*

**Wonderful SULPHUR WATERS, FAMOUS for
Treatment of RHEUMATISM**

Peat, Sulphur, Nauheim, Plombiere, Douche, Pine, & Electric Baths, all up-to-date.

Beautifully laid out Pleasure Gardens, with Bowling, Tennis, and Croquet Greens. Celebrated Orchestra. Golf Course of 18 holes.

Apply for details, **MANAGERESS, PUMP ROOMS, STRATHPEFFER, ROSS-SHIRE.**

SLIEVE DONARD HOTEL

NEWCASTLE, CO. DOWN.

55 MINUTES BY RAIL
FROM BELFAST.

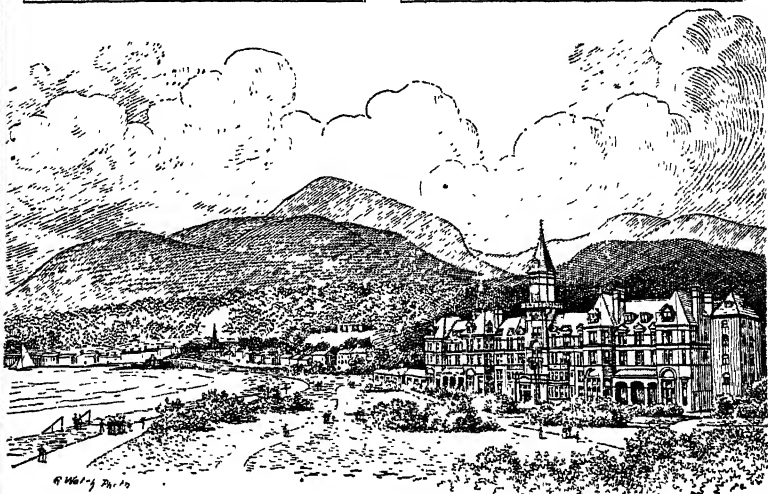
93 MILES FROM DUBLIN.

Telephone:

No. 6 NEWCASTLE.

Telegrams:

SLIEVE, NEWCASTLE,
DOWN.



Stands on own grounds of
12 acres, extending to the
Beach.

Splendid situation, over-
looking Bay.

Over 120 Rooms. Large
Lounge. Elevator.

Hot and Cold Sea Water
Baths.

Adjoining the Links of the
Royal County Down Golf
Club. Reduced Fees to Hotel
Visitors.

IDEAL GOLFING AND
HOLIDAY RESORT.

SUMMER AND WINTER
SEASONS.

ORCHESTRA
throughout the Year.
DANCES.

For Tariff and full particulars
apply to—

J. W. MANNING,
Hotel Manager.

BUXTON.

THE BUCKINGHAM

50 ROOMS.

**High-class RESIDENTIAL and
BOARDING ESTABLISHMENT.**

Electric Light throughout. Moderate Tariff. Telephone and Telegrams: 439.
GARAGE. For Terms apply MR. and MRS. CHAS. MARSHALL.



For COMFORT and HEALTH visit the **CATERHAM SANITARIUM and SURREY HILLS HYDROPATHIC**

Charming country, bracing air, pure soft water and high elevation. Electric light and central heat. Carefully regulated diet and treatment. All baths, massage and electricity. Diathermy and Beigouille Chair. Weir-Mitchell rest cure. Trained nurses. Ideal for rest, recreation, and recuperation.

Medical Superintendent: **Dr. F. G. SHONE.**

Telephone: 88. Telegrams: "HYDRO," Caterham.

"THE LEADING HOTEL,"

PRINCE OF WALES HOTEL, SOUTHPORT

Telegrams:
"Prince,"
Southport.

Telephone:
1431

Pr. Br. Ex.

ON LORD STREET BOULEVARD.

Excellent Cooking. Comfort. Moderate Terms. Great Golfing Centre.
Motorists' Headquarters (R.A.C., A.A., M.U., etc.). Free Garage.
Special Diet arranged for Invalids.

ALSO

ROYAL HOTEL, SOUTHPORT. Best position on Promenade.

CREST HOTEL, Crowborough, Sussex.

Only 80 minutes from London. Situated on the Summit of Crowborough Beacon.
800 feet above Sea-Level. Near Golf Links.

AN IDEAL HEALTH RESORT for BOTH SUMMER and WINTER. Dry
bracing air. Magnificent scenery. Excellent English cooking. Home
comforts. Electric Light throughout. Tennis, Croquet, and Billiards, etc.

Telegrams: "CREST, CROWBOROUGH." Telephone No.: 94.

LLANGAMMARCH WELLS, **CENTRAL WALES.**

The British Nauheim. * Celebrated **BARIUM SPRINGS.**

For **HEART AFFECTIONS, GOUT, and RHEUMATISM.**

Golf (18 holes), Lawn Tennis, Rough Shooting, Fishing in lake
and river, Boating, lovely walks, Billiards, Bowls and Croquet.

LAKE HOTEL.

PUMP HOUSE IN GROUNDS. GARAGE. Telegrams: "BARIUM."
BOOKLET FREE. Apply **MANAGER.**

SOUTHPORT: KENWORTHY'S HYDROPATHIC ESTABLISHMENT (OFF LORD STREET).

A Residential Hotel for Visitors for short or long periods. A home for the **CONVALESCENT**
Visitor desiring Rest and Change, with every comfort. A **PATIENT'S** Resort under
prescription of the Physician to the Hydro, or own medical adviser, to undergo Hydro- or
Electro-Therapy. Suitable for Neuritis, Gout, Rheumatism, Arthritis Deformans, Neurasthenia,
Insomnia, Diabetes, Bronchitis, Constipation, Liver and Stomach and Renal Disorders, &c.
MASSAGE, TURKISH, RUSSIAN, RADIANT HEAT and LIGHT (DOWSING) &c., Baths, STATIC,
HIGH FREQUENCY, DIATHERMY, & SINUSOIDAL ELECTRICITY. Vibratory or Oscillatory
Massage. Sunny aspect. Near Pier, Promenade, Entertainments. Dry, mild, clear, fashionable
winter resort, also favourite summer resort. Postal Address: "Kenworthy's Hydro, Southport."
Phone 80. Telegrams: "Kenworthy's, Southport."

Prospectus from Manageress or Dr. Kenworthy.

TORQUAY.

A MEDICAL MAN, who is an ELECTRO-THERAPIST, has ACCOMMODATION in his own House for PATIENTS sent by doctors and requiring—

Electrical Treatment of any kind.

The House is fully installed with the latest apparatus for all kinds of electro-therapy, including new powerful X-Ray installation, electric baths, sinusoidal, Bergonié, high frequency, static, diathermy, radiant light and heat, ultra violet rays, etc.

FULLY TRAINED NURSE resides in the house, which is situated high up, and has beautiful views of harbour and bay.

APPLY—

Dr. HALLIWELL, Braddons Hill House, TORQUAY.

6th Edition. Revised and Enlarged. Many Illustrations. 9/6 net. Postage 6d.

LECTURES ON MASSAGE AND ELECTRICITY in the Treatment of Disease. By THOMAS STRETCH DOWSE, M.D. Aberd., F.R.C.P. Ed.

BRISTOL: JOHN WRIGHT & SONS LTD.

FUNCTIONAL NERVOUS DISORDERS.

KENLAW HOUSE, Colinsburgh, FIFE

Climate dry and bracing. Within easy reach of St. Andrews and Elie. PSYCHO-THERAPEUTIC, RE-EDUCATIONAL, & OCCUPATIONAL TREATMENT. Two hundred acres of grounds, including private nine-hole golf course. Extensive gardens; workshop. Electric Light. Central Heating. Accommodation for Twenty-five Patients of either sex.

For particulars apply to the Resident Physician: W. H. BRYCE, M.B., C.M., or to the Secretary.

Telephone and Telegrams: Upper Largo No. 8.

The FALMOUTH HOTEL, **FALMOUTH.**

This First-class Hotel stands in its own grounds of 4 acres, and has a magnificent view of the Bay and Pendennis Castle. Certificated Sanitary arrangements.

ELECTRIC LIGHT. AN OTIS ELEVATOR SERVES EACH FLOOR.

Tariff and full particulars on application to the Manager - C. DUPLESSY.

Llandrindod Wells - Ye Wells Hotel

100 BEDROOMS.

South Aspect.

Special attention given to Diet for Visitors taking Treatment.

NEAR the Pump Room, Baths, Golf Links, and surrounding Hills. TWO ELECTRIC LIFTS—outside fire escape staircase—and every modern convenience and luxury. Two full-sized Croquet Lawns and Two Hard Tennis Courts in own grounds. Central Heating.

Telephone No. 133.

Proprietress, Mrs. E. BRYAN SMITH.

BETHLEM ROYAL HOSPITAL,

Lambeth Road, LONDON, S.E. 1

For the Reception and Treatment of Cases of Nervous and Mental Disease.

President—ALDERMAN COL. SIR CHARLES CHEERS WAKEFIELD.

Treasurer—LIONEL FAUDEL-PHILLIPS, ESQ.

Physician Superintendent—J. G. PORTER PHILLIPS, M.D., M.R.C.P.

Senior Assistant Physician—THOMAS BEATON, O.B.E., M.D., M.R.C.P.

Pathologist—CLEMENT LOVELL, M.D.

CONSULTING STAFF.

Surgeon—Arthur Evans, M.S., F.R.C.S.

Gynaecologist—Thos. Geo. Stevens, M.D., F.R.C.S.

Ophthalmologist—J. Francis Cunningham, F.R.C.S.

Laryngologist, &c.—W. Mayhew Mollison, F.R.C.S.

Anæsthetist—Cecil M. Hughes, M.B., B.S.

Dentist—Fredk. Todd, M.R.C.S., L.D.S.

PATIENTS of the Educated Classes, in a presumably Curable condition, are alone eligible for Admission, and may be received either Free, or on payment of a fixed inclusive rate of 3 guineas per week. With a view to the early treatment of Eligible cases Voluntary or Uncertified Patients are admitted.

The following are NOT eligible : {

1. Those who have been Insane more than twelve months, and are considered by the Medical Superintendent to be incurable.
2. Those who are in a state of Idiocy, or subject to Epileptic Fits.
3. Those whose condition either threatens speedy dissolution of life or requires the permanent and exclusive attention of a nurse.

In connection with this Hospital, there is a **CONVALESCENT HOME** on the Surrey Hills at **WITLEY**.

For Forms or further particulars, apply to the Physician Superintendent, J. G. PORTER PHILLIPS, M.D., M.R.C.P.

ST. PATRICK'S HOSPITAL,

DUBLIN.

For the treatment of Nervous and Mental Diseases.

FOUNDED BY JONATHAN SWIFT, D.D., 1745.

THIS historic Institution, the first of its kind in Ireland, has been completely modernized and considerably enlarged. It affords every facility for the treatment of ladies and gentlemen suffering from nervous and mental diseases.

There are branch establishments situated at St. Edmondsbury, Lucan, within a beautifully wooded demesne of about 400 acres. A portion of the demesne is worked as a home farm, from which daily supplies of milk, mutton, poultry and vegetables, etc., are delivered to the three hospitals by means of a motor van. Extensive gardens and recreation grounds. Frequent drives by horse and motor.

MEDICAL STAFF.

Medical Superintendent: RICHARD R. LEEPER, F.R.C.S.I.

Assistant Medical Officer: H. R. C. RUTHERFORD, F.R.C.S.I., D.P.H.

Visiting Physician: RICHARD A. HAYES, M.D., F.R.C.P.I.

Rates of maintenance vary according to the nature of each case and the accommodation required.

For forms and further particulars apply to Mr. A. F. Coe, Registrar, St. Patrick's Hospital, James's Street, Dublin; or, in case of urgency, to the Medical Superintendent.

Telephones : Dublin 538. Lucan 21.



HAYDOCK LODGE

NEWTON-LE-WILLOWS, LANCASHIRE.

Telegraphic Address: "STREET, ASHTON-IN-MAKERFIELD" (two words only).
Telephone: ASHTON-IN-MAKERFIELD, 11.

**A PRIVATE MENTAL HOSPITAL for the MIDDLE & UPPER CLASSES ONLY,
EITHER VOLUNTARILY OR UNDER CERTIFICATES.**

TERMS - from 42/- per week.

HAYDOCK LODGE is a large Country Mansion especially adapted for the care and Treatment of Persons of Unsound Mind, having been enlarged and rebuilt on plans sanctioned and approved by the Commissioners in Lunacy. It is charmingly situated in a healthy and retired neighbourhood, standing in its own well-timbered park of nearly 100 acres, with attached Farm, Gardens, extensive Vineries, Conservatories, Lawn for Tennis, Cricket, Football, Bowls, Croquet and Golf. **NEWTON-LE-WILLOWS** (a first-class station on the L. & N.-W. Ry., midway between Liverpool and Manchester) is two miles distant, where conveyances are always to be had.

The accommodation provided is spacious, comfortable, and home-like, comprising Drawing Rooms for the Ladies, Smoking and Reading Rooms for the Gentlemen, together with large Dining Room, Billiard Room, Library and Ball Room, as well as a number of suitable private Sitting and Bed Rooms, for those who desire them. The Sanitary Arrangements are complete, with convenient Bath Rooms and Lavatories. A part of the House has recently been entirely reconstructed, forming a large Baronial Hall, with adjoining Billiard and Smoking Rooms, and Lavatories fitted with all the latest Sanitary Improvements—the whole affording greatly improved accommodation for Gentlemen. A Hospital has also been added to the Ladies' side of the House, which has greatly facilitated the treatment of the Sick and Feeble. Concerts, Balls, Entertainments, and Reunions are held frequently in the large Ball Room. "Table d'Hôte," presided over by the Medical Superintendent, his Assistant, and the Ladies' Companion, is provided for those who are mentally able to appreciate its amenities.

The Parish Church is within easy distance, and besides Daily Prayers, Service is held in the House every Sunday by the Chaplain. Carriages are kept for the use of the Patients, and those whose condition will allow, and whose friends desire it, spend some time annually at the seaside. Terms vary from £22s. a week. Patients of both sexes can have private apartments and special attendants if required. Voluntary Boarders received without certificates. Recovery rate 50 per cent of the admissions.

Haydock Lodge has also associated with it Establishments at **GRETA BANK** (for Ladies' only), in the Craven district of YORKSHIRE, near Ingleton; and **OVERDALE**, near MANCHESTER, under the management of P. G. MOULD, L.R.C.P., M.R.C.S., late A.M.O. at Chesham Royal Asylum.

Information as to Terms, etc., may be obtained from the—

Resident Medical Proprietor: CHARLES T. STREET, L.R.C.P. Lond., M.R.C.S. Eng.; or the
Resident Medical Licensees and Superintendent: J. C. WOORTON, L.R.C.P. Lond., M.R.C.S. Eng.

Visiting Physicians..... { Sir JAMES BARR, M.D., 72 Rodney Street, Liverpool, Physician to the Liverpool Royal Infirmary, etc.
G. E. MOULD, L.R.C.P. Lond., M.R.C.S. Eng., The Grange, near Rotherham, Physician for Mental Diseases to the Sheffield Royal Hospital.

Dr. STREET or Dr. WOORTON attends at 47 Rodney St., Liverpool, every Thursday, from 2 to 4.

Dr. MOULD at Winter's Buildings, St. Ann's St., Manchester, Tuesday and Thursday, 12.30 to 1.

Incorporated by



Royal Charter.

JAMES MURRAY'S ROYAL ASYLUM, PERTH.

Chairman—The Rt. Hon. The Earl of Mansfield.

THIS MENTAL HOSPITAL, for PRIVATE PATIENTS only, is beautifully situated in the immediate vicinity of Perth, in the midst of extensive Pleasure Grounds, which are surrounded by the fields of the Home Farm.

The INSTITUTION has been entirely re-organized and enlarged by the addition of two wings, for the reception of acute cases, so as to render it an efficient Hospital as well as a comfortable Home.

The **Mansion-House of PITCULLEN**, which is quite separate from the Asylum, and **THE EAST AND WEST VILLAS**, afford the necessary variety of accommodation for modern treatment. **SEVEN GABLES, ELIE**, the sea-side house, is arranged for the reception of those suffering from Mild Mental Disturbance, and for Convalescents.

Telephone—
No. 104 Perth.

For Prospectus, Terms, etc., apply to the—

Physician Superintendent, Dr. W. D. CHAMBERS.

For the Treatment of Mental Diseases.

SHAFTESBURY HOUSE, FORMBY-BY-THE-SEA,

Telephone: No. 8 FORMBY.

Near LIVERPOOL.

THIS HOUSE, specially built and licensed for the **Care and Treatment of a limited number of Ladies and Gentlemen Mentally afflicted**, is delightfully situated near the coast between Liverpool and Southport, so that patients have the benefit of pure bracing sea air, for which Formby is noted. The House is in the country, and stands in several acres of ornamental well-wooded grounds, the surroundings being in every way bright, cheerful and pleasant. All kinds of outdoor and indoor amusements and occupation provided. Voluntary Boarders without certificates admitted.

TERMS MODERATE

Apply DR. STANLEY GILL, Medical Superintendent.

Consultations by appointment at 31, Rodney Street, Liverpool, every Monday and Thursday afternoon.

St. ANDREW'S HOSPITAL

FOR MENTAL DISEASES,

NORTHAMPTON.

FOR THE UPPER and MIDDLE CLASSES ONLY.

President—THE RIGHT HON. THE EARL SPENCER, K.G.



THIS Registered Hospital is pleasantly situated in 118 acres of park and pleasure grounds. Every facility is provided for cricket, football, hockey, croquet, lawn-tennis, bowls, golf, motoring, boating, and gardening. Voluntary Boarders as well as Certified Patients of both Sexes are received for treatment. PRIVATE ROOMS with Special Attendants, in the Hospital or in Villas in the Grounds, can be arranged. The Hospital has a BRANCH ESTABLISHMENT at

MOULTON PARK,

Two miles from the Hospital, where there is a farm of 517 acres, which supplies the Hospital with meat, milk, and other farm produce.

BRYN-Y-NEUADD HALL, LLANFAIRFECHAN.



THE SEASIDE HOUSE OF ST. ANDREW'S HOSPITAL, is beautifully situated in a Park of 331 acres, close to the Sea, and in the midst of the finest scenery in North Wales. Patients can enjoy good cricket, lawn-tennis, croquet, golf, trout-fishing, and bathing. Patients or Boarders may visit this Branch for long or short periods, and can have Private Rooms in Villas in the Park.

For Terms and further particulars apply to the MEDICAL SUPERINTENDENT,
ST. ANDREW'S HOSPITAL, NORTHAMPTON. Telephone No. 56.

New Saughton Hall, ^{POLTON, MIDLOTHIAN.}

The only Private Hospital for the Treatment of Mental Cases in Scotland.



NEW SAUGHTON HALL, which takes the place of Saughton Hall, established in 1798, is situated seven miles south of Edinburgh, in the beautiful neighbourhood of Hawthornden and Rosslyn, and is surrounded by picturesque and well-timbered pleasure grounds extending to 125 acres. There is also a **SEASIDE HOUSE** at **GULLANE, EAST LOTHIAN**.

RAILWAY STATIONS—Polton five minutes; and Loanhead, ten minutes' walk from the Institution—reached in half-an-hour from the Waverley Station, Edinburgh. *Telephone: 4 Loanhead.* Forms of Admission for Voluntary or Certified Cases, full instructions, etc., can be obtained on application to the Resident Medical Supt., **S. RUTHERFORD MACPHERL, M.D. Edin.**

Terms from £157 to £525 per annum, according to requirements.

THE COPPICE, NOTTINGHAM.

Hospital for Mental Diseases.

President: The Right Hon. **EARL MANVERS.**

THIS Institution for the reception of **PRIVATE PATIENTS** of both sexes of the **Upper and Middle Classes** only, at moderate rates of payment, is beautifully situated in its own grounds about two miles from Nottingham, and from its singularly healthy and pleasant position, and the comfort of its internal arrangements, affords every facility for the **Relief and Cure of those Mentally Afflicted.** Divine Service is held in the Institution every Sunday by the Chaplain, who also visits the Patients. Carriage and motor exercise is provided.

— FOR TERMS, ETC., APPLY TO —

DR. HUNTER, Physician-Superintendent.

STRETTON HOUSE,

CHURCH STRETTON, SHROPSHIRE.

A Private Licensed House for the treatment of Gentlemen suffering from Nervous or Mental Diseases.

ESTABLISHED 1853.

SITUATED amongst charming scenery, more than 600 feet above the sea, large grounds, pure water, perfect sanitation, and enjoying the bracing air of the "English Highlands."

Easily accessible from all parts. Good train services on G.W. and L. & N.W. Railways.

Congenial occupation and recreation are specially attended to, and all sorts of indoor and outdoor amusements are provided.

Patients have carriage exercise by arrangement, and daily walks amongst the beautiful mountain scenery.

For Terms and further information, apply to—

THE MEDICAL SUPERINTENDENT.

Telegrams :
"Stretton House, Church Stretton."



Telephone :
10, Church Stretton.

KINGSDOWN HOUSE,

BOX (Near BATH).

Telephone: No. 2 Box.

LICENSED FOR THE TREATMENT OF DISEASES
OF THE BRAIN AND NERVOUS SYSTEM.

THIS House is situate 450 feet above sea level, and commands extensive views of the surrounding country.

Access—Box Station (G.W.R.); Bath Stations (Midland and G.W.R.) twenty minutes from the house.

For terms apply to—

Dr. H. C. MacBRYAN, *Resident Proprietor & Medical Superintendent,*
at the above,

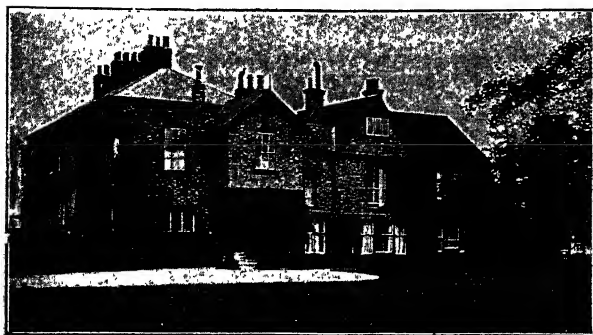
Or at 17, BELMONT, BATH.

Telephone: No. 636, BATH.

The PLEASAUNCE, YORK.

Old Established MENTAL HOME for LADIES.

Telephone: 184 YORK.



Licensed for 22 Ladies of the Upper & Middle Classes. The House stands in extensive well-wooded Grounds within the boundary of the city.

A special feature is made of the Treatment of Incipient Mental Cases, Certified or Voluntary.

Terms and Prospectus on application to the Licensees—

LEONARD D. H. BAUGH, M.B.; (Mrs.) JANIE S. BAUGH, M.B.

ESTABLISHED 1824.

The Retreat Private Asylum, NEAR ARMAGH.

For the CURE and TREATMENT of Ladies and Gentlemen of the Upper and Middle Classes suffering from

MENTAL AND NERVOUS DISEASES.

Voluntary Boarders and Inebriates admitted without Medical Certificates.

This Retreat is beautifully situated in picturesque grounds and farm of nearly 150 acres, and Patients enjoy the greatest possible liberty. There is a large percentage of Recoveries on recent admissions.

For particulars apply to Resident Medical Superintendent,
Dr. J. GOWER ALLEN, J.P.

**MALE & FEMALE
NURSES'
INSTITUTION**

**SUPPLIES
TRAINED
NURSES
FOR
ALL
CASES**

**HOPE HOUSE,
HOPE STREET,
LIVERPOOL.**

TELEPHONE
2570
ROYAL.
NIGHT
OR
DAY.

TELEGRAMS
"NURSES"
LIVERPOOL
—
ESTABLISHED
1878.

The Nervous, Intemperate, and Mentally Afflicted

Provided with SUPERIOR MALE and FEMALE (HOSPITAL AND ASYLUM TRAINED) NURSES and ATTENDANTS

At a Moment's Notice.

ESTABLISHED 1814.

NORTHUMBERLAND HOUSE,

GREEN LANES, FINSBURY PARK, N.

Telephone No : 888 North. Telegrams: "Subsidiary," London.

**An INSTITUTION for the Care and Treatment of
Ladies and Gentlemen suffering from NERVOUS
and MENTAL AFFECTIONS.**

Four miles from Charing Cross ; nearest Station, Finsbury Park (G.N. and N. London Railways) ; Tubes to City and West End. Electric Cars from Finsbury Park Station run every few minutes past the gates.

Six acres of ground, highly situated, facing Finsbury Park.

Private Villas, in suites of rooms.

Voluntary Boarders received without certificates.

SEASIDE BRANCH AT WORTHING.

For Terms and other particulars apply to **RESIDENT PHYSICIAN.**

CITY of LONDON MENTAL HOSPITAL **Near DARTFORD, KENT.**

Under the management of a Committee of the Corporation of the City of London.

PRIVATE PATIENTS are received at the rate of from two to three Guineas per week. An Illustrated Booklet giving full particulars can be obtained from the Medical Superintendent. The Institution is within two miles of Dartford Station, on the S.E. Railway, and is about 16 miles from London.

Telephone : **57 DARTFORD.** Telegraphic Address : **CITY ASYLUM, DARTFORD.**

OTTO HOUSE, **47, North End Road, WEST KENSINGTON, W.14.**

Telephone : Hammersmith 1004.

**A HOME FOR THE CARE AND TREATMENT OF LADIES
MENTALLY AFFLICTED.**

Apply to Miss BRODIE (Resident Lady Superintendent).
Mrs. SUTHERLAND (Licensed Proprietress).

EAST SUSSEX COUNTY MENTAL HOSPITAL.

Accommodation is provided for Private Patients. The Estate comprises 400 acres, and is situated on high ground nine miles north of Eastbourne, and four miles west of Pevensey Bay. There is a separate detached block for children. For particulars apply to

The Medical Superintendent, The Hospital, HELLINGLY.

HOLLOWAY SANATORIUM

VIRGINIA WATER.

*A Registered Hospital for the CURE and CARE
of the INSANE and of NERVOUS INVALIDS
— of the MIDDLE and UPPER CLASSES. —*

THIS Institution is situated in a beautiful and healthy locality, within easy reach of London. It is fitted with every comfort. Patients can have Private Rooms and Special Attendants, as well as the use of General Sitting Rooms, at moderate rates of payment. Voluntary Boarders not under Certificates can be admitted.

There is a BRANCH ESTABLISHMENT at CANFORD CLIFFS, BOURNEMOUTH, where Patients and Boarders can be sent for a change and provided with all the comforts of a well-appointed home.

*For Terms, apply to the RESIDENT MEDICAL SUPERINTENDENT,
St. Ann's Heath, Virginia Water, SURREY.*

BOREATTON PARK

THIS PRIVATE ASYLUM, which was founded by the late W. H. O. SANKEY, M.D., F.R.C.P., for the reception of a limited number of

LADIES & GENTLEMEN MENTALLY AFFLICTED,

— is now conducted by his son, —
E. H. O. SANKEY, M.A., M.B., B.C. Cantab.

The Ladies' Division is directly supervised by Mrs. SANKEY.

The Mansion stands high, among handsomely laid out gardens in the midst of a picturesque deer park (about 40 head of deer are kept), and commands a magnificent view of Welsh mountain scenery.

Carriages, horses, motor, lawn-tennis, golf, trout and other fishing are provided.

Arrangements can be made to enable friends of patients to reside in the House as Boarders if so desired.

The Asylum is situate about ten miles from Shrewsbury, within easy distance of Baschurch Station, G.W.R., whither carriages can be sent at any time for visitors.

Letters and Telegrams should be addressed to—

Dr. SANKEY, Boreatton Park, Baschurch, SALOP.

THE WARNEFORD

HEADINGTON HILL, OXFORD.

A Registered Hospital for the Care & Treatment of both Sexes of the Upper and Middle Classes, when suffering from Nervous and Mental Disorders. . .

President—THE RIGHT HON. THE EARL OF JERSEY.

Chairman of the Committee—REV. WM. ARCHIBALD SPOONER, D.D.,
Warden of New College, Oxford.

Vice-Chairman—

SURGEON-GENERAL SIR A. FREDERICK BRADSHAW, K.C.B.

THIS HOSPITAL is pleasantly situated on Headington Hill, on the outskirts of the City of Oxford. The grounds, which extend to over 70 acres, command extensive views of the surrounding country.

The buildings are arranged, so far as is compatible with the requirements of a Mental Hospital, in the manner of an ordinary private residence.

VOLUNTARY BOARDERS ARE RECEIVED.

For terms and further particulars, apply to the—

Physician Superintendent, ALEX. W. NEILL, M.D.

THE GRANGE, Near Rotherham

A SANATORIUM OF THE HIGHEST CLASS FOR THE

CARE & CURE OF MENTAL INVALIDS (Ladies).

Consulting Physician: CROCHLEY CLAPHAM, M.D., F.R.C.P.E.

Resident Physician: G. E. MOULD, M.R.C.S. Eng., L.R.C.P. Lond.

Physician for Mental Diseases to the Sheffield Royal Hospital.

THE House is a spacious Family Mansion, with extensive pleasure grounds, including good Croquet and Tennis Grounds, and an immense Park, containing Private Drives and Walks of several miles in extent. It is situated in the heart of the famous Robin Hood Country (5 miles from Sheffield, 4 from Rotherham) and is surrounded by beautiful scenery, and an atmosphere free from smoke and impurity. Situation dry and healthy. The arrangements are of a domestic character. The Proprietors welcome visits from the usual Medical Attendant of the Patient during her residence. Under the New Act Voluntary Patients can be received, without Certificates, on own personal application. The Rev. R. T. C. SLADE, Mus. Bac., Vicar of Thorpe-Hesley, acts as Chaplain, and conducts regular Services.

The Resident Physician may be seen at the Grange; or at Leavygreave House, Hounsfield Road, Sheffield, by appointment. (Nat. Tel. No. 34, Rotherham.)

GRANGE LANE STATION (M. S. & L. Railway) is within a quarter of a mile of the Grange, and may be reached via Sheffield or Barnsley direct; or via Rotherham changing at Tinsley.

For TERMS, FORMS, &c., APPLY TO THE RESIDENT PHYSICIAN.

CLARENCE LODGE,

CLARENCE ROAD, CLAPHAM PARK.

A LIMITED number of LADIES suffering from MENTAL and NERVOUS DISORDERS are received for treatment under a Specialist. The House stands in large grounds.

For further Particulars see Illustrated Prospectus from the Proprietress.

Telephone: 494 Brixton.

MRS. THWAITES.

ASHWOOD HOUSE,

KINGSWINFORD, STAFFORDSHIRE.

An old-established and modernized Institution for the Medical Treatment of Ladies and Gentlemen Mentally Afflicted.

THE House, pleasantly situated, stands in picturesque grounds of forty acres in extent, with a surrounding country noted for the beauty of its walks and drives. The climate is genial and bracing. Occupation, indoor and outdoor amusements, and carriage and other exercise amply provided.

TERMS vary according to requirements as to accommodation, special attendance, etc.

TELEPHONE : 19, KINGSWINFORD.

Railway Stations: Stourbridge Junction (G.W.R.), $3\frac{1}{2}$ miles; Dudley (L. & N.W.R.), 4 miles; Wolverhampton (G.W.R. or L. & N.W.R.), 7 miles.

FOR FURTHER PARTICULARS APPLY TO THE MEDICAL SUPERINTENDENT.

NORTHWOODS HOUSE,

WINTERBOURNE, near BRISTOL.

A Sanatorium for Ladies and Gentlemen suffering from Nervous and Mental Disorders.

SITUATED in a large Park, 300 feet above sea level, in a healthy and picturesque locality, easily accessible from London, Bristol, and Cardiff by Winterbourne Station; or from Fishponds, Yate, or Patchway Stations.

Voluntary Boarders received without Certificates.

For further information, see London Medical Directory, p. 2149, and for Terms, etc., apply to Dr. J. D. THOMAS, Resident Medical Proprietor, Northwoods House.

Dr. THOMAS attends at 64, PARK STREET, BRISTOL,
on Mondays and Thursdays, from 12 to 1.30 o'clock.

TELEPHONE No. 18 WINTERBOURNE.

Bucks Mental Hospital

THE COMMITTEE OF VISITORS are prepared to receive

PRIVATE PATIENTS on Moderate Terms.

Separate accommodation is provided for Private Patients on the Male and Female sides of the Institution. The Hospital is situated in the Country, three miles from Aylesbury Station, and about forty miles from London.

For further particulars apply to the MEDICAL SUPERINTENDENT—

DR. H. KERR, STONE, AYLESBURY.

BARNWOOD HOUSE, GLOUCESTER.

A REGISTERED HOSPITAL for MENTAL DISEASES, for PRIVATE PATIENTS Only, of the UPPER and MIDDLE CLASSES.

ARRANGED and furnished with all the most approved appliances for the treatment, comfort and amusement of the Inmates. Within two miles of the Railway Station, and easily accessible by Rail from London and all parts of the Kingdom. It is beautifully situated at the foot of the Cotswold Hills, and stands in its own grounds of 250 acres. Voluntary Boarders not under certificates are admitted. The MANOR HOUSE for Ladies only, which is entirely separate from the Hospital and standing in its own grounds, will be utilized exclusively for voluntary patients.

For Terms, etc., apply to ARTHUR TOWNSEND, M.D.,
Telephone: No. 7 BARNWOOD. *Resident Superintendent.*

PLYMPTON HOUSE, PLYMPTON, SOUTH DEVON. ESTABLISHED 1834.

PLYMPTON HOUSE is licensed for the accommodation of both sexes, and is well adapted by its position and appointments for the Medical Treatment and Care of Patients of the Upper and Middle Classes, suffering from MENTAL DISEASE.

The Proprietors, Dr. ALFRED TURNER and Dr. J. C. NIXON, have had very large experience of Mental cases, both in public and private institutions, and everything that can be done to ameliorate the condition of the chronic, and promote the cure of the acute cases—placed under their charge—is guaranteed.

TERMS ON APPLICATION
Telephone: No. 2 PLYMPTON.

Letters and Telegrams;
DR. TURNER, PLYMPTON.

PRIVATE PATIENTS.

Three Counties Mental Hospital, ARLESEY, BEDS.

Special accommodation for Paying Patients of both sexes is provided at "East View" and "West View."

Ample provision is made for treatment, occupation, and entertainment of the patients.

The situation is high, rural, and the air bracing.

Terms from **42s.** per week, including all necessaries except clothing.

Further particulars and forms of admission may be obtained on application to the Medical Superintendent.

THE RETREAT, YORK.

A Registered Hospital for the Treatment of MENTAL DISEASES.

ESTABLISHED 1792.

Nat. Telephone: 112 York.

Under the management of a Committee of Members of the Society of Friends. Situated about two miles from York Station. The Patients are derived from the **Upper and Middle Classes**, and none are paupers or rate-aided. **Terms from £6 6s. weekly.**

Voluntary Boarders are received on their own application.

For further particulars see the Annual Report, which will be sent on application to **Dr. BEDFORD PIERCE**, the Medical Superintendent.

RETREAT TRAINED NURSES DEPARTMENT.

Staffed by Nurses who have been trained for four years in the Retreat, and conducted upon a profit-sharing basis. **MENTAL & NERVOUS CASES** only undertaken.

TRAINED FEMALE NURSES, ♦ Apply **MATRON**, Retreat, YORK.
£4 4s. Weekly. ♦ Nat. Tel. 112.

Early Treatment of Mental Disorders

MILLFIELD, YORK (for Gentlemen).

Established by a Committee of the Society of Friends for the **TREATMENT OF NERVOUS MALADIES and BORDERLAND CASES** on a voluntary basis. Millfield stands in about eight acres of grounds at the South East boundary of the City, and has been purchased and equipped specially for the purpose. No certifiable persons can be received.

Applications for admission may be made to the Matron, Millfield, Hull Road, York; or to the Secretary, **A. FRED BURGESS**, 107 Heslington Road, York.

THROXENBY HALL, near SCARBOROUGH (for Ladies).

Under the management of the same Committee. For the **TREATMENT OF NERVOUS DISORDERS**, under similar conditions to Millfield, York. Throxenby Hall is about two miles from Scarborough, and is delightfully situated near the Raincliffe Woods.

Applications to the Matron at Throxenby Hall, Scarborough (Tel. 282); or to **A. FRED BURGESS** as above.

The **SILVER BIRCHES**, Church Street, EPSOM.

This Home has been established over 60 years for the Care and Treatment of Ladies suffering from Mental Ailments.

TERMS, etc., on application to—

Miss M. O. DANIEL, Res. Licensee, or to Dr. E. C. DANIEL, Co-Licensee.

Telephone: 346 P.O. Epsom.

TUE BROOK VILLA, LIVERPOOL, E.

PRIVATE HOSPITAL for the **CARE and TREATMENT OF LADIES and GENTLEMEN MENTALLY AFFLICTED.** **VOLUNTARY BOARDERS** also received without certificates.

For Terms apply to MEDICAL SUPERINTENDENT.

BAILBROOK HOUSE, BATH.

For the Care and Treatment of Ladies and Gentlemen
Suffering from Nervous or Mental Breakdown.
Special Attention is given to the Curative Treatment of Early Cases.

Resident Licensee :—DR. NORMAN LAVERS.

Beautiful Mansion standing in 25 acres of well-wooded Park, with lovely views of Bath and surrounding country. Ten minutes' drive from G.W.R. and

Midland Stations, Bath. Telephone 49 Bath.

Carriages, Billiards, Lawn Tennis, Croquet. Fishing, Boating, Golf, etc., near.

VOLUNTARY BOARDERS RECEIVED.

The Electric Trams to Bathford pass the entrance gates of Bailbrook House.

Terms Inclusive, from Six Guineas per week, according to circumstances of case and accommodation required.

SPRINGFIELD HOUSE

NEAR BEDFORD.

(TELEPHONE No. 17.)

A PRIVATE MENTAL HOSPITAL.

ORDINARY TERMS: FIVE GUINEAS WEEKLY.

Physicians { DAVID BOWER.
CEDRIC W. BOWER.

LAVERSTOCK HOUSE

Near SALISBURY.

*A Private Home for the Care and
Treatment of Mental Disorders.*

SEPARATE VILLAS AVAILABLE FOR SUITABLE CASES.

VOLUNTARY BOARDERS RECEIVED WITHOUT CERTIFICATES.

For terms and particulars apply to MEDICAL SUPERINTENDENT.

Tel.: JACKSON, LAVERSTOCK.

'Phone: 12 SALISBURY.

PRIVATE ASYLUMS. CO. DUBLIN.

HAMPSTEAD, Glasnevin, for Gentlemen | HIGHFIELD, Drumcondra, for Ladies.

For the Cure and Care of Patients of the Upper Class suffering from
Mental and Nervous Diseases and the Abuse of Drugs.

Telephone No. 1032.

Telegrams: "Eustace," Glasnevin.

These Hospitals are built on the Villa System, and there are also
Cottages on the demesne (154 acres), which is 150 ft. above the sea level
and commands an extensive view of the Dublin Mountains and Bay.

Voluntary Patients admitted without Medical Certificates.

For further information apply for illustrated prospectus, etc., to the Resident Medical
Superintendents: DR. HENRY MARCUS EUSTACE, Highfield, Drumcondra, or DR. WILLIAM
NIELSON EUSTACE, Hampstead, Glasnevin; or at the Office, 41, Grafton Street, Dublin.
Telephone 198. On Mondays, Wednesdays and Fridays, at 2.30 p.m.

ST. GEORGE'S RETREAT BURGESS HILL, SUSSEX.

This Private Asylum is under the Management of a community of Augustinian
Nuns. It receives Lady Patients only, who are under the immediate care of the
Sisters, and are visited regularly by a physician of special experience. The
establishment is supplied with every requisite for the treatment and well-being of
the Patients; and the grounds (280 acres) afford ample space for their recreation
and exercise. It is within two miles of Burgess Hill Station, on the London
and Brighton Railway, and is easily accessible from all parts of the kingdom.

For particulars and terms apply to—

THE REV. MOTHER SUPERIOR, ST. GEORGE'S RETREAT.

CORPORATION MENTAL HOSPITAL, PORTSMOUTH.

Accommodation is provided for Ladies and Gentlemen in Two Detached
Villas, at a charge from **Three Guineas** upwards, including all necessaries
except clothing.

APPLY - MEDICAL SUPERINTENDENT.

West Sussex County Mental Hospital, GRAYLINGWELL, CHICHESTER.

PRIVATE PATIENTS are received at low
rates of maintenance from **2½** guineas per week.

Particulars supplied on application to the
MEDICAL SUPERINTENDENT, Graylingwell Hospital, Chichester.

LONDON COUNTY MENTAL HOSPITAL, CLAYBURY, WOODFORD BRIDGE, ESSEX.

Private Patients. Special Accommodation for Male Paying Patients is provided at "THE HALL," adjoining this Mental Hospital.

TERMS, at present exclusive of clothing and special luxuries, for Patients having a legal settlement in the County of London, 63s. per week; for others, 73s. 6d. per week.

Full particulars can be obtained on application to the **Asylums Officer, London County Council, Fitzalan House, 13 Arundel St., Strand, W.C.2**

All applications will be considered in the order in which they are received.

Established 1826.

PECKHAM HOUSE, 112, PECKHAM ROAD, LONDON, S.E.

Telegrams: "Alleviated, London."

Telephone: New Cross, 576.

AN Institution licensed for the CARE and TREATMENT of the MENTALLY AFFLICTED of both Sexes. Conveniently situated. Electric trams and omnibuses from the Bridges and West-End pass the House. Private houses with electric light for suitable cases adjoining the Institution. Holiday parties sent to the Seaside branch at Worthing during Summer months.

Moderate Terms:—

Apply to MEDICAL SUPERINTENDENT for further particulars.

Coton Hill Mental Hospital Near STAFFORD.

Chairman of the Committee of Management, The Right Hon. the EARL OF DARTMOUTH.

THIS Hospital, which is beautifully situated in a high and healthy position, with extensive grounds, cricket field, lawn tennis courts, golf links, &c., is devoted to the **Care and Treatment of the Mentally Afflicted of the Upper and Middle Classes.** Terms on application. Private Rooms with Special Attendants in the Hospital, or Semi-detached Villas in the grounds can be arranged.

FOR FURTHER PARTICULARS, APPLY TO

R. W. HEWSON, L.R.C.P. & S. Edin., Medical Superintendent.

Cornwall Mental Hospital, BODMIN.

CAREW BUILDING—A DETACHED BLOCK FOR
MALE & FEMALE PRIVATE PATIENTS

This Building is quite distinct from the Main Building,
and has separate Recreation Grounds.

For TERMS and FURTHER PARTICULARS, apply to the Medical Superintendent.

UPLANDS.

A Large Detached Villa, in connection with the Cheshire County Asylum, MACCLESFIELD, for the RECEPTION OF PRIVATE PATIENTS of both sexes. FEES, from £1 15s. upwards, according to accommodation. Apply for Prospectus to—

H. DOVE CORMAC, M.B., M.S., Medical Superintendent.

TELEPHONE: MACCLESFIELD 17.

BOOTHAM PARK, YORK.

A REGISTERED MENTAL HOSPITAL
for the Treatment and Care of Nervous and
Mental Invalids of the Upper & Middle Classes

For Particulars apply to the Medical Superintendent—

GEORGE RUTHERFORD JEFFREY, M.D. Glasg., F.R.C.P.E., F.R.S.E.

The Lawn, Lincoln.

A REGISTERED HOSPITAL for MENTAL DISEASES,
situated in the City of Lincoln, near to the Cathedral.

FOR TERMS, APPLY TO

DR. RUSSELL, Resident Medical Superintendent.

WYE HOUSE ASYLUM,

Telegrams—
130 BUXTON.

BUXTON, DERBYSHIRE.

Telephone—
BUXTON 130.

It is situated on an eminence commanding extensive views of the surrounding country. The House is heated throughout by means of hot-water apparatus and open fireplaces. Buxton is situated on the mountain limestone formation, 1,000 feet above sea level. The climate is wonderfully bracing, and its reputation as an inland watering place for invalids is undoubted.

Terms and Particulars of Wye House can be obtained on application to the Medical Superintendent - - - W. W. HORTON, M.D.

Newlands House

TOOTING BEC COMMON,
LONDON, S.W.17.

*Private Mental
Hospital.*

Telephone :
STREATHAM 524.

THE MENTAL HOSPITAL

DIGBYS, near EXETER.

The above Hospital, situated in healthy country, three miles from Exeter, RECEIVES PRIVATE PATIENTS OF BOTH SEXES.

**FEES from 2 guineas
per week.**

*Particulars on application to the
MEDICAL SUPERINTENDENT.*

CAMBERWELL HOUSE,

33 PECKHAM ROAD, S.E. 5.

Telegrams—"PSYCHOLIA, LONDON."

Telephone—New Cross 1057.

For the Treatment of MENTAL DISORDERS.

COMPLETELY detached Villas for Mild Cases. Voluntary Boarders received. Twenty acres of grounds, including extensive allotments on which gardening is encouraged. Tennis, Croquet, Squash Racquets, and all Indoor Amusements. Daily Services in Chapel.

Senior Physician : FRANCIS H. EDWARDS, M.D., M.R.C.P.

An Illustrated Prospectus, giving full particulars and terms, may be obtained on application to THE SECRETARY.

HOVE VILLA, BRIGHTON—A Convalescent Branch of the above,
To which also suitable Patients may be sent on holiday.

Just Published. Ninth Edition. Large 8vo. 665 pages. 35 s. net. Postage 1 s. With 262 Illustrations, Including Four Plates.

TEXT-BOOK OF NERVOUS DISEASES.

For the use of Students and Practitioners of Medicine.

By CHARLES L. DANA, A.M., M.D., LL.D.,

Professor of Nervous Diseases in Cornell University Medical College ; Consulting Physician to Bellevue Hospital ; Neurologist to the Montefiore Hospital, and to the Women's Hospital ; Consulting Physician to the Manhattan State Hospital, etc.

It is now twenty-eight years since the first edition of this text-book. The successive volumes present in a measure a record of the advancement of neurology during that period.

In the present edition the Author has endeavoured to keep in touch with established progress. Material has been added bearing on the subjects of Neurological Surgery and Injuries of the Nerves, and the results of Shock and Emotional Strain caused by the war.

Chapters have also been added on Psychology, in its dynamic, descriptive and physiological phases, and on Endemic Encephalitis or Encephalitis Lethargica.

"For over a quarter of a century this work has held a leading place as a text-book for students and practitioners of medicine. The present edition contains all the good points of its predecessors."
—*New York Medical Journal.*

Crown 8vo. 6/6 net. Postage 6d.

PUBLIC HEALTH CHEMISTRY AND BACTERIOLOGY.

A PRACTICAL MANUAL.

By DAVID McKAIL, M.D., D.P.H., F.R.F.P.S. Glasgow,

Lecturer on Public Health and Forensic Medicine, St. Mungo's College, Glasgow ; Lecturer on Hygiene to Nurses, Glasgow Royal Infirmary.

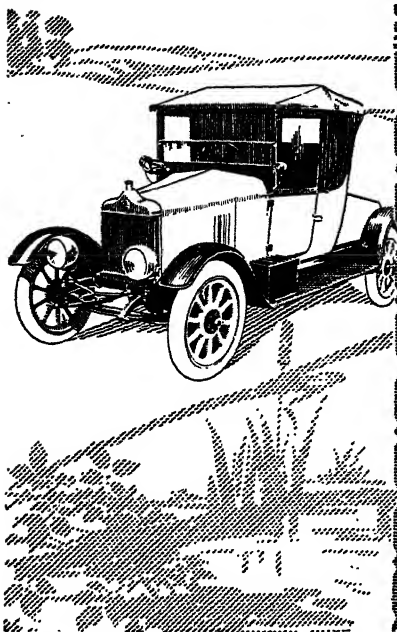
Compiled from the author's notes for his class. It is intended to supplement actual laboratory teaching.

"The work is based on the author's actual experience in teaching these subjects, and will be found a very useful volume for the purpose for which it is intended."—*Brit. Med. Jour.*

Bristol : John Wright & Sons Ltd.

London : Simpkin & Co. Ltd.

Ad. 7



Gutholds.

The All  British.**Standard**

Light 2- and 4-Seaters.

*Specially designed for the Owner-driver.***Do You Know ?**

THAT the "Standard" is the ideal car for the Doctor who drives and tends his own car ?

—that the "Standard" Hood and Side Curtains are operated so easily that the transformation can be effected in a few seconds ?

—that the result is a perfectly closed car which offers the same protection as a Limousine—without either the weight or expense ?

—the complete "Standard" car weighs less than 17 cwt., and that light weight means low running costs ?

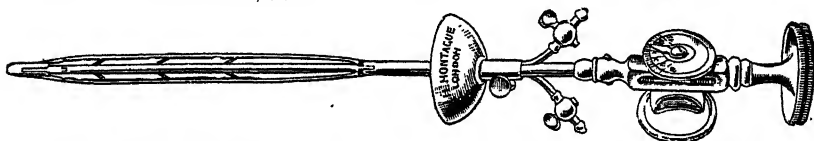
Write us for full particulars.

The Standard Motor Co. Ltd., Coventry,
London Showrooms: 49 Pall Mall, S.W.1

J. H. MONTAGUE,

*By Appointment to the Honourable Council of
India, St George's Hospital, St. Peter's Hospital,
etc., etc.*

**Surgical Instrument
Maker and Cutler.**



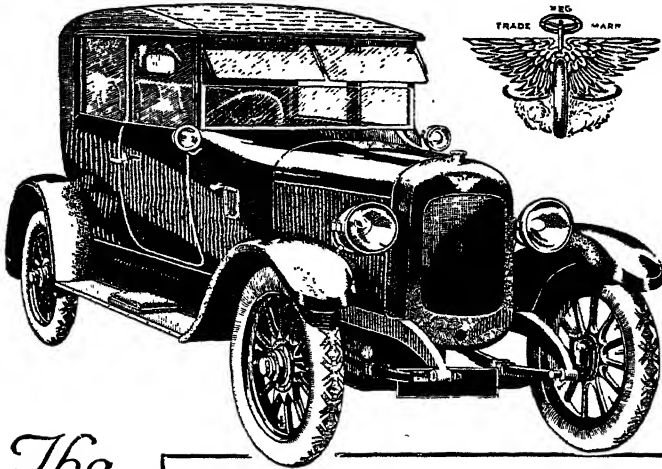
KOLLMANN'S ANTERIOR & POSTERIOR IRRIGATING DILATORS.

Urethrosopes and Instruments of the
latest patterns for Venereal Clinics.
Estimates submitted for complete
equipment

69 New Bond St., London, W.1.

Telegraphic Address:
"MASTOID, LONDON,"

Telephone:
No. 2651 GERARD.



The AUSTIN TWENTY

"THE
ADVOCATE"
is a little journal of
motoring specially
interesting to all
Austin Car Own-
ers. Its hints and
tips on the car are
practical and save
the owner many
pounds in a year.
Annual subscrip-
tion 5/- Specimen
copy 6d.

THE AUSTIN TWENTY is eminently suited to medical and professional men. It combines dignity with economy in maintenance. The admirable quality of material and workmanship renders it trustworthy on every road and in all weathers. The comfortable and convenient coupé body has distinction in finish and upholstery.

Owing to unique facilities for production, it is possible, in spite of ever-increasing demand, to give EARLY DELIVERY.

THE AUSTIN MOTOR CO., LTD.

Head Office—Northfield, BIRMINGHAM.

Telephone—
King's Norton 230.

Telegrams—
"SPEEDILY, NORTHFIELD."

LONDON: 479-483 OXFORD STREET, W.1.
MANCHESTER: 130 DEANSGATE,
And at BRUSSELS and LANCOURT.

ANDERSON & WHITELOW

*Branch of Associated
Surgical Appliance
Makers, Ltd.*



ARTIFICIAL LIMBS

**Surgical Boots,
Belts, Trusses,
AND
Deformity
Appliances.**

BIRMINGHAM: Broad St. Corner.
HEAD OFFICE.

BIRMINGHAM: Balsall Heath Rd.
FACTORY.

LONDON: 37, Manchester Street,
Manchester Square, W. 1.

GLASGOW: 15, Newton Terrace
Charing Cross.

EDINBURGH: 2, Coates Place.

LIVERPOOL: 35, Canning Street.

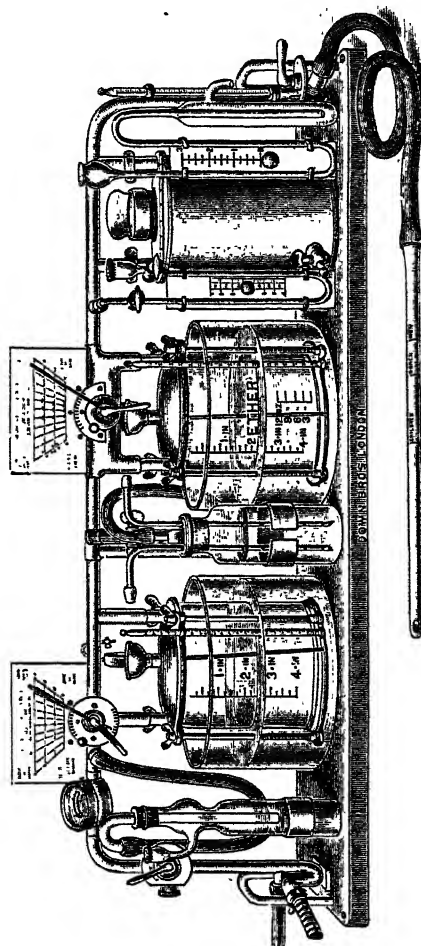
COVENTRY: 2, The Quadrant.

DOWN BROS.' SPECIALITIES.

A DOSIMETRIC ANÆSTHETIC UNIT

FOR THE

Intra-Tracheal Insufflation of Chloroform, Ether, N_2O and O or Mixtures, Pharyngeal Insufflation, etc.



Suggested by Dr. CLARENCE MOTT, of Burslem.

PARTICULARS AND PRICE ON APPLICATION.

Manufactured by

GRANDS PRIX:
PARIS 1900, BRUSSELS 1910, BUENOS AIRES 1911.



GOLD MEDAL
ALLAHABAD 1910.

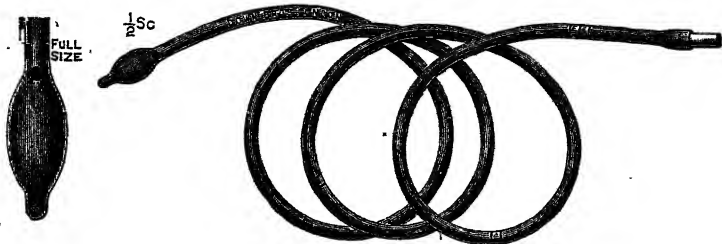
DOWN BROS. LTD.

Surgical Instrument-Makers,
21 & 23 St. Thomas's St., London, S.E.1
(OPPOSITE GUY'S HOSPITAL)
and Tabard Works, Tabard St., London, S.E.1

Telegraphic Address:
(Registered throughout the world)

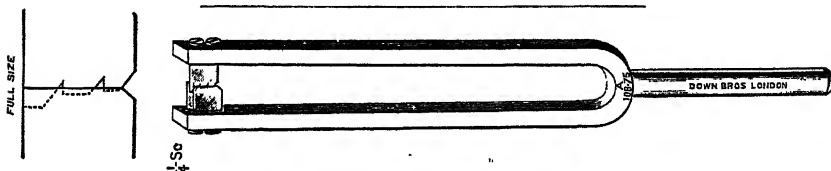
"DOWN, LONDON."

Telephone:
Hop. 4400 (4 lines).



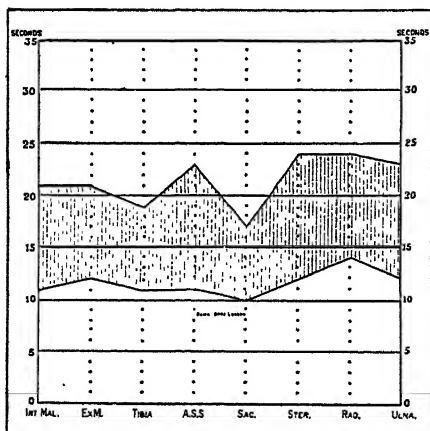
DUODENAL TUBE for the Fractional Analysis of Test Meals.

As made for Mr. JOHN A. RYLE, M.D., F.R.C.S., Guy's Hospital.
Vide *Lancet*, Sept. 4th, 1920.



TUNING FORK for Estimating Impairment of the Vibratory Sensation.

As made for Dr. J. L. M. SYMNS. Vide *Medical Annual*, 1920.



WOOD'S CHARTS

(Dr. C. A. WOODS),

As used by

Dr. ARTHUR HURST for
Recording Observations

LITERATURE:

Guy's Hospital Reports, January, 1921,

SEE ALSO

Symns, J. L. M., *Brit. Med. Jour.*, 1912,
i. 539.

Symns, J. L. M., *Guy's Hosp. Reports*,
Lond., 1912, lxvi. 120.

Symns, J. L. M., *Quarterly Jour. Med.*,
Oxford, 1917, ii. 33-58.

Particulars and Prices on
application.

Manufactured by

GRANDS PRIX:
PARIS 1900, BRUSSELS 1910, BUENOS AIRES 1911.



GOLD MEDAL
ALI AHABAD 1910.

DOWN BROS. LTD.

Surgical Instrument Makers.

21 & 23 St. Thomas's St., London, S.E.1

(OPPOSITE GUY'S HOSPITAL)

and Tabard Works, Tabard St., London, S.E.1

Telegraphic Address:
(Registered throughout the
world)

"DOWN, LONDON."

Telephone:

Hop. 4400 (4 lines).

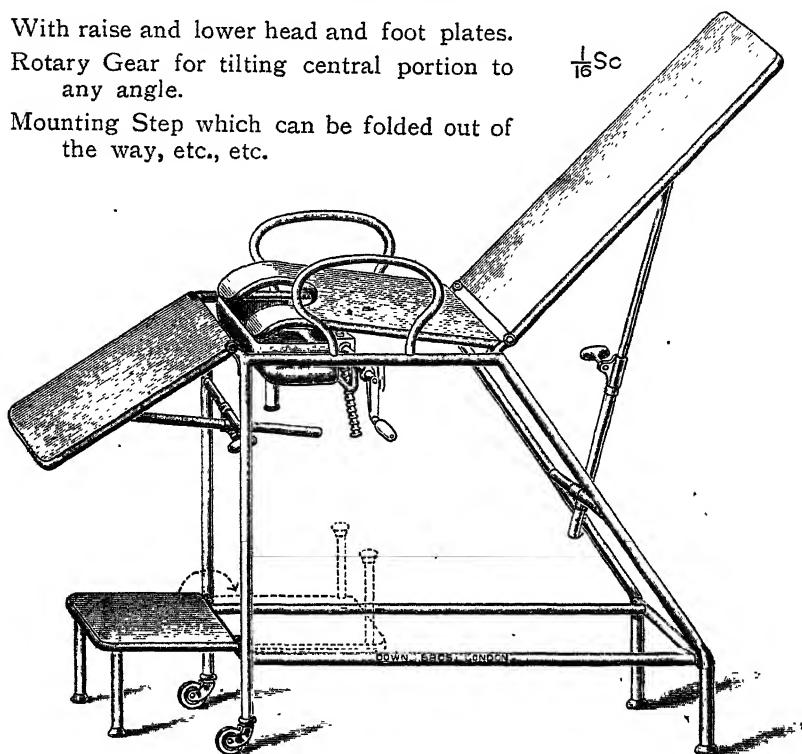
ASEPTIC OPERATION TABLE and CHAIR Combined

For Gynæcological and Genito-Urinary Examination and Treatment.

With raise and lower head and foot plates.

Rotary Gear for tilting central portion to any angle.

Mounting Step which can be folded out of the way, etc., etc.



PARTICULARS and PRICE ON APPLICATION.

Manufactured by

GRANDS PRIX :
PARIS 1900, BRUSSELS 1910, BUENOS AIRES 1911.



DOWN BROS. LTD.

Surgical Instrument Makers,
21 & 23 St. Thomas's St., London, S.E. 1

(OPPOSITE GUY'S HOSPITAL)

and Tabard Works, Tabard St., London, S.E. 1

Telegraphic Address :

(Registered throughout the world)

"DOWN, LONDON."

Telephone

Hop. 4400 4 lines.

Revolution in Radiography.

THE GREVILLE READ

"RADIO METRIC" X RAY APPARATUS.



RADIO.

Because it gives an abundance of X Rays.

METRIC.

Because all the factors determining the perfect radiogram, accurate dosage in Radiotherapy, and clear vision in fluoroscopy are measurable and controllable.

IMPORTANT NOTE.

Hitherto great skill has been required by the Radiologist because with the pre existing apparatus at least two of the most important factors in his work were left to the judgment of the operator, and even with the most expert workers the estimate of these unknown factors was little more than a guess, hence varying results were obtained.

The RADIO METRIC apparatus does not call for any great skill on the part of the operator as the unknown factors previously referred to are now known and controlled, hence we are able to supply a simple slide rule with each apparatus that will enable anyone, even though they have had no previous experience in X Ray work, to take a perfect radiogram.

The apparatus has no revolving parts, is interrupterless, noiseless; it is therefore free of all parts likely to wear out or call for frequent adjustment.

The longest exposure necessary for the taking of a radiogram of the thickest and most dense part of the body is

ONE SECOND.

Full particulars will be sent post free on request for RADIO METRIC CATALOGUE No. 3.

We cordially invite the Medical Profession to our showrooms to enable us to prove by practical demonstration the above statements.

Price as Illustrated.
For Alternating Current .. £195
For Direct Current .. £275
Complete Control Throughout.

THE MEDICAL SUPPLY ASSOCIATION, Limited,
MANUFACTURERS OF X RAY APPARATUS,
167/185, Gray's Inn Road, LONDON, W.C.1.

The Largest X Ray and Electro Medical Showrooms in the United Kingdom.
Highest Award for X Ray Apparatus at Last International Medical Congress.




ELECTRO-THERAPEUTICS

The largest X-ray & Electro Medical Showrooms in the United Kingdom.
Awarded Grand Prix last International Medical Congress.
SOME OF OUR MANUFACTURES.

	£ s. d.
No. 1—The "Galvanoset," on Oak Pedestal with Faradisation Attachment ..	21 10 0
No. 2—Vibratory Massage Apparatus ..	7 5 0
No. 3—Hot and Cold Air Douche ..	5 15 6
No. 4—Hand Lamp for Radiant Heat and Light applications ..	2 10 6
No. 5—"Limpet" Universal Electrode Outfit ..	2 18 6
No. 6—Safety X-ray Tube Rack ..	2 5 0
No. 7—New "Physio" Faradic Wave Apparatus ..	9 9 0
No. 8—Diathermy Apparatus ..	81 0 0
No. 9—High-Speed Static Electrical Machine ..	117 0 0
No. 10—"Victory" High Frequency and Diathermy Attachment ..	34 4 0
No. 11—Spamer Faradic Battery ..	3 8 6
No. 12—Clinic Galvanic and Faradic Table ..	36 0 0
No. 13—Professor Bergonie's Apparatus ..	1-2 18 0
No. 14—Reclining Model Radiant Heat and Light Bath ..	61 4 0
No. 15—"Ideal" X-ray Apparatus ..	137 18 6
No. 16—Universal Radiant Heat and Light Apparatus ..	27 0 0
No. 17—"Noir et blanc" X-ray Tube ..	10 6 0
No. 18—Radiant Light and Heat Bath ..	9 18 0

Fully descriptive catalogues of the above apparatus will be sent free on request.

Please indicate the items in which you are specially interested.

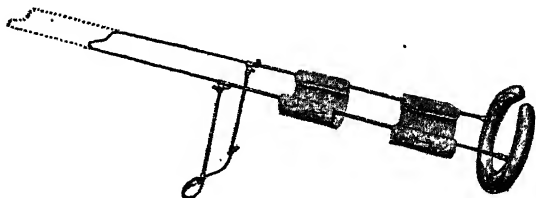
WE CORDIALLY INVITE THOSE INTERESTED IN MEDICAL ELECTRICITY TO VISIT OUR SHOWROOMS.

MEDICAL SUPPLY ASSOCIATION LTD

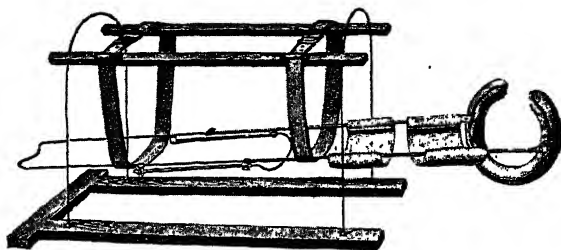
Electro-Medical Instrument Manufacturers,
167-173,
GRAYS INN RD.,
LONDON, W. C.1.







PATENT ADJUSTABLE AND



STANDARDIZED LEG SPLINTS

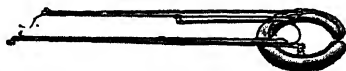


LEFT LEG.



RIGHT LEG.

ADAPTABLE TO ANY LEG.

£1 15s.£1 15s.

FOLDED FOR TRANSPORT.

FULL DESCRIPTIVE PAMPHLET ON REQUEST.

THE
MEDICAL SUPPLY ASSOCIATION LTD.

167/185 Gray's Inn Road, LONDON, W.C.1

ROGERS Violet Ray High Frequency

*The very latest of
Electrical Treatment*

affords almost instant
Relief to most of the
many Ailments afflict-
ing the Human Body.

A Demonstration will
acquaint you with some
surprising results from
this form of treatment.

Full Illustrated List
Free on request.

*Enthusiastically adopted by
Electro-Theraputists,
Physicians, Dental
Surgeons, Hospitals,
Nursing Institutions,
Etc.*



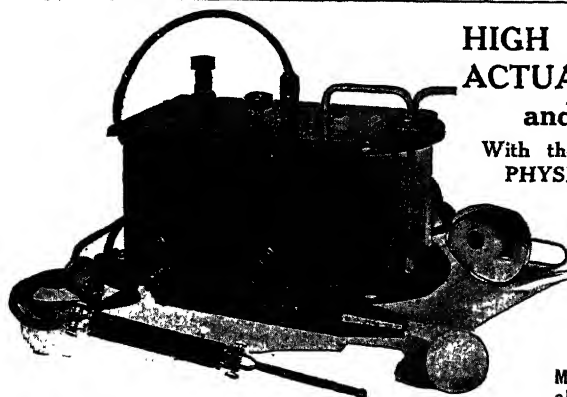
A really Portable
**HIGH FREQUENCY
OUTFIT. Type "H."**

Fully Guaranteed.

The most perfect Outfit for Facial, Head, & Body Massage.
TREATMENT CHART and INSTRUCTION BOOK
supplied with each Outfit.

Professional Trade Price · £10 10s.

Complete in Carrying Case and 3 Electrodes.



HIGH FREQUENCY, ACTUAL CAUTERY, and OZONE,

With the Production of the
PHYSICIAN'S TYPE "O."

We are placing
on the market an
Instrument that will
fully answer all re-
quirements of either
the
General Practitioner
or the Specialist.

Mounted in a neat port-
able and convenient Case.

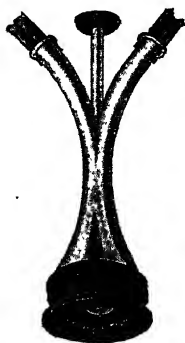
The Type "O" delivers High Frequency, Actual Cautery, and Ozone.
Professional Trade Price, £17 17s. Complete with all Attachments
and 3 Electrodes.

**The ROGERS ELECTRIC SALES Co. (GREAT
BRITAIN)**
31 Craven St., LONDON, W.C.1, ENGLAND.

Telegraphic Address; "Dentition. Westrand, London." Telephone No.: Gerrard 8728.

NEW BI-AURAL STETHOSCOPE

British and Foreign Patents granted. (MARR PATENTS.)



Half actual size.

Every Bi-aural is Tested before being issued.

This Patented improvement secures the following advantages over the Bi-aurals at present in use by the Medical Profession:—

- 1.—It secures a greater amplitude of vibrations to the ear.
- 2.—The patent can be fixed quickly to all existing stethoscopes without increasing the bulk or weight.
- 3.—As no diaphragm is used in the stethoscope to produce the increased amplitude, the true, natural tone of the pulsations are received only, and distortion in consequence is avoided.
- 4.—The chest wall is the natural diaphragm in this patent.
- 5.—A variation of the volume of sound can easily be secured by varying the pressure of the stethoscope slightly, from a deep sonorous to a firmly higher pitched note.
- 6.—A faint pressure on the chest gives the best result.

The high efficiency of the Marr Stethoscope is obtained by concentrating the sound waves on the inner surface of the two-way mount. These sound waves are then continued on to the earpieces, thus confirming the theory of surface conduction, and securing a greater amplitude of vibrations on the tympanum of the ear arising from breath sounds, all adventitious sounds of the lungs, cardiac bruits, and normal heart sounds.

In auscultatory work it is specially adaptable and acute.

NEW SENSITIVE EAR-CONE

(MARR PATENTS.)

This Instrument has been designed for those partially deaf, to secure clear articulate speech, and has been reduced to a size which will enable the user to carry it in a side pocket, or, in the case of a lady, to be placed in the reticule. It is a sound wave concentrator, constructed to carry the speech direct to the tympanum of the ear. There is nothing electrical or complex in its design, it requires no renewals, and is always ready for use.

Will be found of great assistance to persons with perfect hearing whilst listening to speeches at public halls, churches, etc.; and it is also of great value for concerts, enabling the user to hear the artiste, or the orchestra, clearly and articulately. In this instrument the harmonics are largely eliminated, and the true tone and expression of the speaker or singer are at once demonstrated. The vibrating baffle plate inside the Ear-Cone largely secures the bulk of the sound waves travelling on the inner surface of the instrument, and they thus reach the tympanum of the ear in larger amplitude.

Various forms of Ear-Cones are constructed from this patent, and its application to Telephone Instruments achieves a much greater efficiency in the transmission of speech for long distances.

Highest Testimonials from the Medical Profession.

Terms for sale of Foreign Patents, or for Royalties, on application to

THE MARR STETHOSCOPE SYNDICATE.

23 Reynell Road, Longsight, MANCHESTER.

Sole Agents: { England and Wales—MAYER & PHELPS, 59-61 New Cavendish Street, LONDON, W.1
 { Scotland and Ireland—ARCHIBALD YOUNG & SON, EDINBURGH.

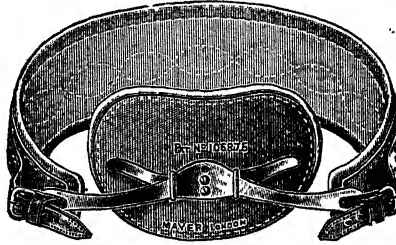
BOMBAY PRESIDENCY—E. & W. ANDREW, LTD,



Half actual size.

The Walton Abdominal Support— Supports.

It is the only support that will effectually raise and retain the abdominal viscera in its normal position with ease and comfort.



The Walton Support is indicated:—

In all cases of Ptois, Enteroptosis, Gastropnois, Visceroptosis and Ventral Hernia—For use after abdominal operations—Appendicectomy, Ovariectomy, Hernia, etc.—For incipient Hernia—For Pendulous Abdomen—For use during or after confinement—For treatment of Obesity, assisting Digestion, and relieving Constipation.

Full particulars of above will be found in

“CHIRON”

A descriptive Supplementary Catalogue of recent Surgical Instruments and Appliances of interest to Physicians and Surgeons. Sent post free on request.

Mayer & Phelps

CHIRON HOUSE,
59-61 New Cavendish Street,
LONDON, W.1.

Surgical Instrument
Manufacturers,

Established over Fifty Years.



Telephone
Mayfair 6320.

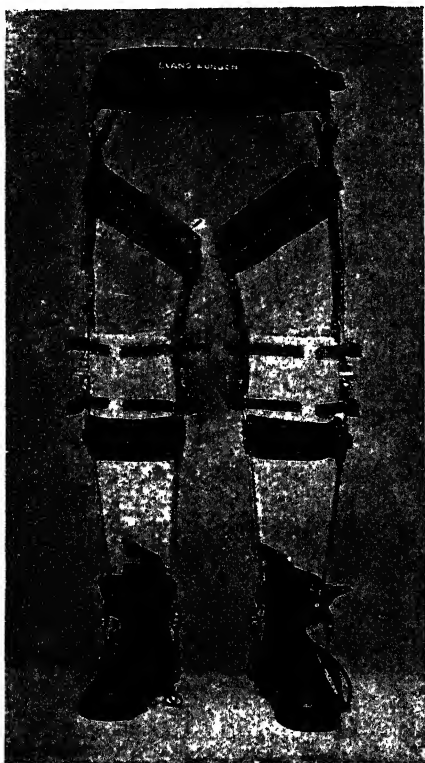
Telegrams:
"Trephine, Wesdo, London."

A. E. EVANS

Telephone :
Museum 4738

38 Fitzroy St., W.1

Factory :
Hertford Place, W.1



**Orthopaedic
Apparatus
and Artificial
Limbs for all
Deformities and
Deficiencies.**

Send for Detailed Catalogue.

ESTABLISHED 1890.

Makers to

ROYAL NATIONAL
ORTHOPAEDIC HOSPITAL,
and many other
General and Military Hospitals,
Ministry of Pensions, etc. ..

W. R. GROSSMITH'S

(Branch of Associated Surgical Appliance Makers Ltd.)

**ARTIFICIAL
HANDS, ARMS, LEGS AND
EYES**
PERFECT COMFORT. EXTREME LIGHTNESS.

Established in Fleet Street 1760.

Prize Medals: LONDON, PARIS, DUBLIN, and
Queen Mary's Hospital Exhibition, 1915.

Accurate Fitting Guaranteed, — Natural Movement.

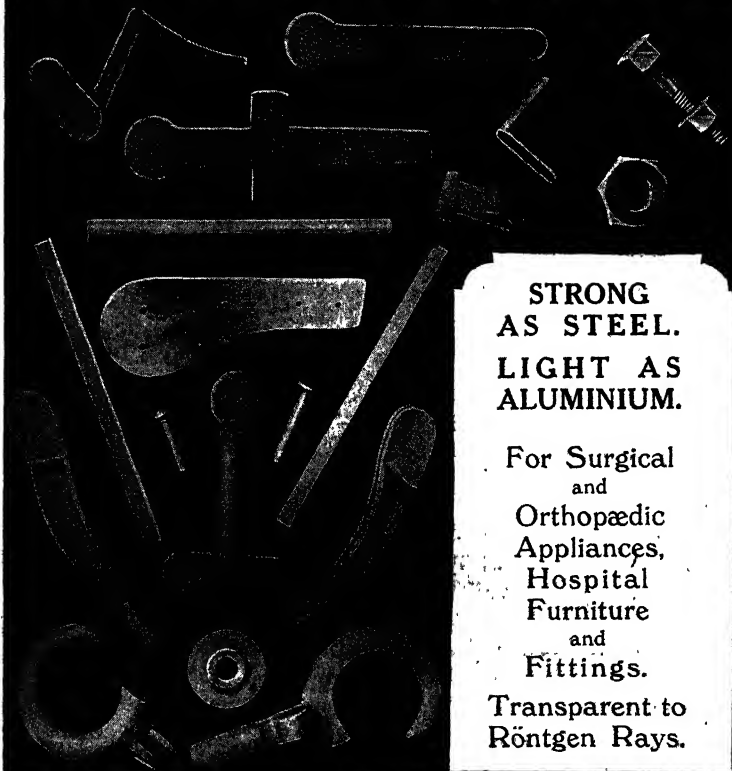
ILLUSTRATED CATALOGUE POST FREE OF

W. R. GROSSMITH, Telephone :
GERARD 918.
12 Burleigh St. facing 110 Strand, W.C. 2
and at 54 Dyke Road, BRIGHTON.

World-
wide
reputation
for
excellence
of
construction.



“VICKERS’ DURALUMIN.”



**STRONG
AS STEEL.
LIGHT AS
ALUMINIUM.**

For Surgical
and
Orthopædic
Appliances,
Hospital
Furniture
and
Fittings.

Transparent to
Röntgen Rays.

VICKERS' LIMITED,

VICKERS HOUSE, BROADWAY, LONDON, S.W.1

AN ALLOY OF ALUMINIUM
WITH THE STRENGTH AND
HARDNESS OF MILD STEEL,
BUT HAVING ONLY ONE THIRD
OF ITS WEIGHT.

**Depots :*

Manchester, Bristol,
Newcastle, Birmingham
Glasgow, Norwich,
Leeds, Belfast.

PHILIP HARRIS-SPECIALITIES

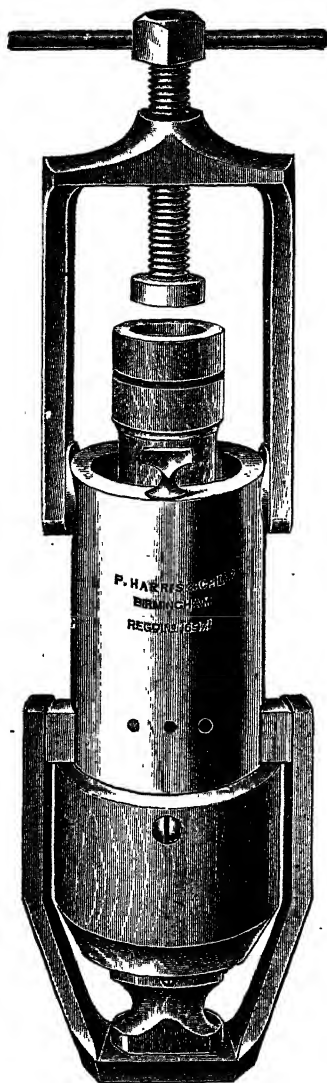


Fig. 1.

The "Hall-Edwards" Carbon Dioxide Snow Collector and Compressor.

Apparatus for Collecting and Applying Carbon Dioxide Snow.

SEE THE LITTLE MANUAL:—

CARBON DIOXIDE SNOW: Its Therapeutic Uses. By J. HALL-EDWARDS, L.R.C.P., F.R.S. (Edin.), Hon. F.R.P.S. London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd. 1913. Crown 8vo, pp. 93. 3s. 6d. net.

— **SOLE MANUFACTURERS.** —

ADVANTAGES:—The Collector not only admits of obtaining the small and necessary amount of snow for one treatment without undue waste, but it renders it unnecessary to transfer the snow from one piece of apparatus to another.

The snow is always of the same hardness and the test of complete and proper compression is that the cone should sink in water.

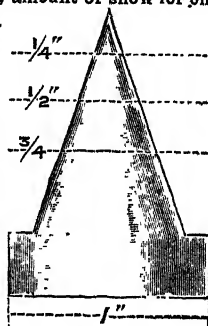


Fig. 9.

Fig. 9.—Diagram of Compressed Snow, showing broad base and cone-shaped projection. The transverselines indicate the positions for cutting off the cone so as to produce a circle of any desired diameter.



Fig. 10.

Fig. 10.—The applicator showing cone of compressed snow projecting from its lower end.

SET No. I.—

Hall-Edwards' Improved Set for producing CO_2 Hard Snow, comprising:—Collector, fitted with top and bottom stirrup compressor (see Fig. 7), Special Rammer and Metal Rods, also used for producing compressed small pencils of hard snow, Hardwood Applicator for holding cone of snow (see Fig. 10), Special Nipple and Union for attaching to Cylinder. The above apparatus is made of Lignum-Vitæ and Delta Metal, nickel plated complete £4 4 0

SET No. II.—

Same as specification No. 1, but including a 4lb. Cylinder filled with CO_2 , Key and Metal Stand for holding Cylinder.. .. complete £6 6 0

SET No. III.—

Same as specification No. 1, but including a 7lb. Cylinder, filled with CO_2 , Key and Metal Stand for holding Cylinder.. .. complete £7 17 6

Full Particulars on Application, and sent with each set.

PHILIP HARRIS & CO. LTD. BIRMINGHAM, Eng.

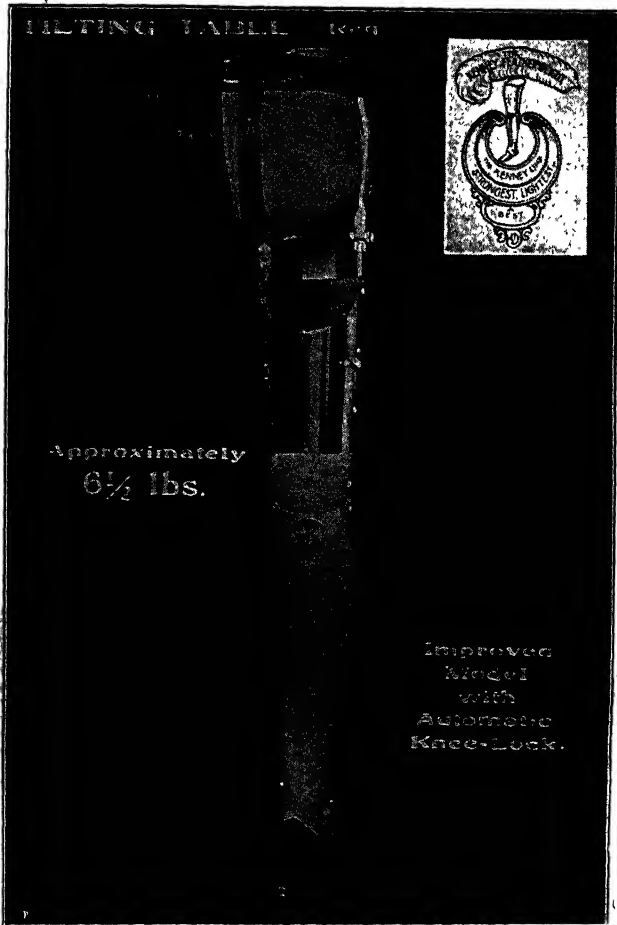
THREE striking features in "KENNEY" Featherweight Limbs:

COMFORT WITHOUT FATIGUE!

SIMPLICITY WITH EFFICIENCY!

STRENGTH WITHOUT WEIGHT!!

Telegraphic Address: "ENNEYLIMBSK. HOLB. LONDON."



Approximately
6½ lbs.

Improved
Model
with
Automatic
Knee-Lock.

Telephone: HOLBORN 4740.

The "Kenney" Limb Co. Ltd.,

Limb Makers and Orthopaedic Specialists,

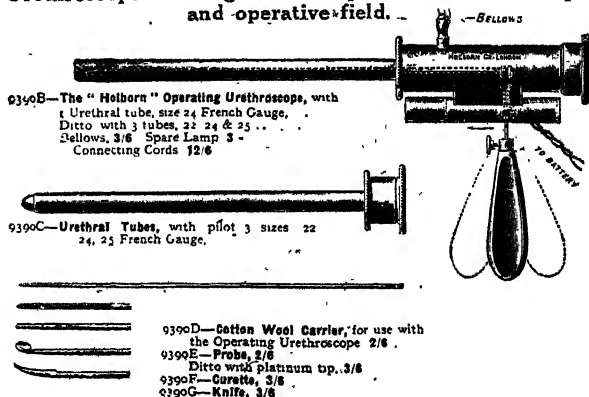
45, BEDFORD ROW, LONDON, W.C.1.

THE "HOLBORN" OPERATING URETHROSCOPE

(RIMMER'S Patent No. 132925)

Used at the MILITARY HOSPITAL, ROCHESTER ROW,
— and by many of the LEADING V.D. SPECIALISTS. —

The only Urethroscope which gives the Operator an uninterrupted visual
and operative field. —



9390B—The "Holborn" Operating Urethroscope, with
1 Urethral tube, size 24 French Gauge.
Ditto with 3 tubes, 22, 24 & 25 ...
Bellows, 3/6 Spare Lamp 3 -
Connecting Cords 12/6

9390C—Urethral Tubes, with pilot 3 sizes 22
24, 25 French Gauge.

9390D—Cotton Wool Carrier, for use with
the Operating Urethroscope 2/6
9390E—Probe, 2/6
Ditto with platinum tip, 3/6
9390F—Curette, 3/6
9390G—Knife, 3/6

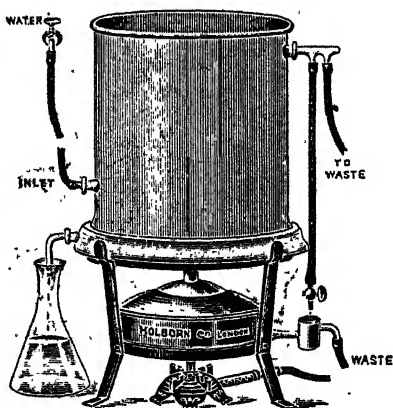
9390 M—COMPLETE SET, containing both Operating and Examining
Urethroscopes, 3 Tubes, Connecting Cords, 4 Instruments, double
Bellows, 3 Lamps, 2 Batteries, Nickel-plated Battery Case with Rheo-
stat in substantial Case. ... £11 11 0

THE "Holborn" AUTOMATIC STONEWARE STILL

(RIMMER'S Patent No. 13413)

The most perfect Still on the Market.
Produces absolutely pure distilled water.
Works automatically and requires no
attention. Simple in construction. Most
reasonable in price. No Hospital should
be without one.

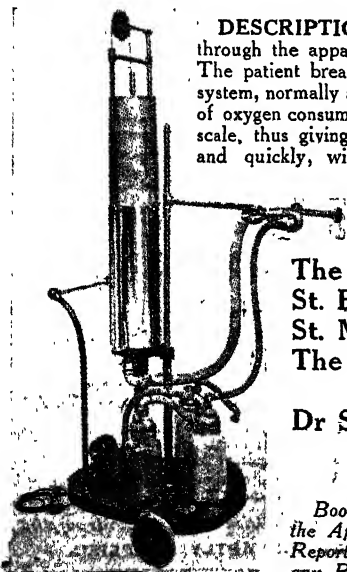
Price complete, as illustrated,
but without gas burner ... £9 10 0
Gas Burner, as illustrated ... 0 18 6
Primus Stove (for use when
gas is not available) ... 1 10 0



THE
HOLBORN SURGICAL INSTRUMENT CO.
LIMITED,
26 Thavies Inn, Holborn Circus, LONDON, E.C.1

THE SANBORN BENEDICT METABOLISM APPARATUS

has been proved by Hospitals and Physicians to be especially valuable in the diagnosis and treatment of all cases of hypo- and hyperthyroidism, goitre and other diseases of the glands of internal secretion.



NEW MODEL.

DESCRIPTION:—Oxygen-rich air is circulated through the apparatus by means of an electric blower. The patient breathes from and exhales into this closed system, normally and without discomfort. The amount of oxygen consumed is shown by direct reading from a scale, thus giving determination of metabolism, simply and quickly, without the necessity of gas analysis.

This Apparatus is now being used in London by the following:—

The London Hospital.
St. Bartholomew's Hospital.
St. Mary's Hospital.
The London School of
Medicine for Women.
Dr Strickland Goodall,
Harley Street, W.

Booklet A, giving a full description of the Apparatus, together with a Series of Reports of Clinical Cases, will be sent to any Physician or Hospital on request.

Blood Pressure Determinations

should be part of a Physician's routine in the examination of every patient; the diastolic as well as the systolic pressure should always be taken. The Practitioner, however, should not be content with taking the pressure once only. He should repeat the determination over a considerable period, and thus establish a normal for each patient.

The SANBORN BLOOD PRESSURE OUTFIT gives a rapid and accurate determination of systolic, diastolic and pulse pressures. It is portable and easy to use. **Price Four Guineas only.**

An Outfit will be sent to any Physician for 14 days' trial in practice.

SANBORN COMPANY (London), 11 VICTORIA STREET,
LONDON, S.W.1.

Makers of Scientific Apparatus.

BROWNE & SAYER

*Surgical Dressings,
Bandages, Trusses,
Clinical Thermometers,
Catheters, Ligatures,*

*Bottles, Corks,
Wrapping Paper,
Labels,
Surgical Instruments.*

Telephone - 3735 North.

30, Highbury Place, :: LONDON, N.5.

BRUCE, GREEN & Co. Ltd.,

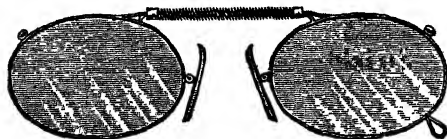
Manufacturing Opticians,

14, 16, 18, Bloomsbury St., LONDON, W.C.

Telegraphic Address: "SYSAVER, LONDON."

Telephone: MUSEUM 503.

TRIAL FRAMES, LENS MEASURES, Etc.



FACIAL MEASURING SETS

By which a frame that fits perfectly is quickly and easily obtained. Free to Medical Men.

Instruction in use of above given free at our Offices by capable Instructors.

Write for Price List and full particulars.

Prescription Forms & Cards supplied free.

OPTICAL PRESCRIPTION WORK PROMPTLY SUPPLIED.

2nd Edition. Crown 8vo. With numerous Diagrams. 5/6 net. Postage 4d.

THE PRESCRIBING OF SPECTACLES. By A. S. PERCIVAL, M.A., M.B.,
Senior Surgeon to the Eye Infirmary, Newcastle-on-Tyne.

"A valuable treatise."—*Brit. Med. Jour.*

BRISTOL: JOHN WRIGHT & SONS LTD.

F. G. ERNST,

(Branch of Associated Surgical Appliance Makers Ltd.)

80, 82, Charlotte Street, Fitzroy Square, LONDON, W.1.

Telephone:
MUSEUM 1380.

Telegrams:
"SPINALIS OX," LONDON.

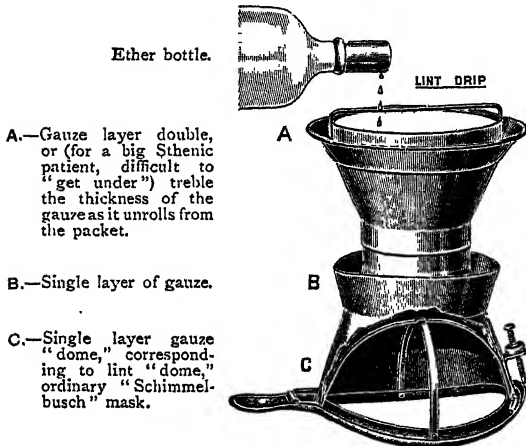
**SURGICAL & ORTHOPÆDIC APPLIANCES,
ARTIFICIAL LIMBS.**

Designer of the SPECIAL TRUSS for MOVABLE KIDNEY as recommended
by Sir FREDERICK TREVES.

The PICTON MASK

.. FOR ..

OPEN ETHER ADMINISTRATION WITHOUT CHILL.



The advantage of warm ether is mainly that it causes less depression of vitality than cold ether, and less liability to ether pneumonia. That is now an axiom, but the ordinary warm apparatus (requiring a fatiguing hand-pump and other complexities) only raises the temperature to about body heat, which this mask secures, or sufficiently and approximately secures, automatically. In addition the present mask, a wide tube, certainly does in practice produce smooth deep (automatic) breathing.

Price - £3 : 3 : 0

The Salient Points of the principles on which the PICTON ANÆSTHETIC MASK for "OPEN ETHER" is based are :

1. The fabric soaked with evaporating ether is 8 in. away from the face.
2. Two other layers of fabric filter the ether vapour, permitting it to mix with warm expired air. Thus the inspired mixed air and ether vapour is warmed automatically.
3. Breathing through a tube causes deep breathing; (on account of the stimulus to the respiratory centre by the CO_2 in the tube). Air is fairly freely obtained as a result of this deep breathing through the gauze diaphragms; hence though there is enough CO_2 to cause deep breathing, cyanosis does not result. (The deep breathing involves suction of blood into the R. auricle owing to increase of negative pressure on the great veins in the chest; hence less shock is likely.)
4. Minor advantages are smooth induction of anæsthesia, and that the ether does not come into contact with the face. (The channels or collars within and without help to secure this.)

MANUFACTURED BY

BROWNE & SAYER,

Telephone :
North 3735.

30 Highbury Place, LONDON, N. 5

Telegrams: "FORCEPS, EDINBURGH." Telephone No. 747.

J. GARDNER & SON

Surgical Instrument Manufacturers,
Aseptic Furniture Manufacturers,
Artificial Limb Manufacturers,
Truss and Bandage Manufacturers,

To H.M. WAR OFFICE,
To THE EDINBURGH ROYAL INFIRMARY,
ROYAL SICK CHILDREN'S HOSPITAL,
ROYAL MATERNITY HOSPITAL,
DEACONESS HOSPITAL, ETC.

Warehouse and Offices:

32 Forrest Road, Edinburgh.

Works: CANDLEMAKER ROW, EDINBURGH.



J. CRITCHLEY & SONS

Partners: W. H. CRITCHLEY and T. JARVIS.

18 Great George St., LIVERPOOL.

*Original Makers of H. O. Thomas's
Splints for Hip, Knee and Ankle
Joints, Thomas's Osteoclast and
Talipes Wrench.*

Malleable Metal Fracture Splints, all sizes,
Metal Finger & Toe Splints & Talipes Splints,
as used by Sir ROBERT JONES, of Liverpool.

Manufacturers of Artificial Limbs suitable for
all amputations, Abdominal Belts, Trusses,
Spinal Supports, Crutches, &c., &c.

Illustrated Price List on application.

Established 1873. Telephone: Royal 2648.

PLEASE NOTE our ONLY ADDRESS.

CONTRACTORS TO H.M. WAR OFFICE.

Gamgee Tissue

This Dressing, introduced by us, and of which we are the sole proprietors and manufacturers, is deservedly increasing in favour with the profession. We quote the following extract from a clinical address delivered by SAMPSON GANGE, Esq., F.R.S.E., Consulting Surgeon to the Queen's Hospital, Birmingham.

"On purely surgical grounds, I have no hesitation in stating that the absorbent Gauze and Cotton Tissue, prepared at my suggestion by Messrs. ROBINSON & SONS Ltd. of Chesterfield, is the most generally useful and comfortable, the most easily manageable and most economical surgical dressing with which I am acquainted.

"The Tissue, as made in long lengths, is perfectly uniform in surface and thickness and can be cut to any shape or size to pad the trunk or the limbs, in case of disease or injury. Powerfully absorbent and elastic, the Tissue, is equally serviceable for drainage and compression, for dressing blisters and burns, wounds and ulcers, sprains and fractures. The Tissue does not lump together, but remains uniform, and is a most soothing and healing application to inflamed joints and many skin affections.

"The Tissue is susceptible of any antiseptic medication, and it also takes up plaster of Paris cream, liquid glass, collodion, or paraffin so readily as to form an excellent basis for splintage and moulds. A limb or the trunk may be very speedily and effectually immobilized by surrounding it with a layer of the dry Tissue, and outside that placing a layer or intersecting slips of the same material, previously soaked in plaster of Paris cream or other solidifiable substance"—which is best kept in its desired position by ROBINSON & SONS' Absorbent Bandages.

When ordering this Dressing insist on the packet bearing the words "GAMGEE TISSUE," many imitations, irregular in thickness and inferior in quality, being on the market under the name of Cotton Wool and Gauze Tissue.

Capsicum Tissue

Made from our well-known Gamgee Tissue, charged with the active essence of Capsicum and Methyl Salicylate.

The distinctive feature of our Manufacture is the combination of Methyl Salicylate with the Capsicum.

The Gamgee Tissue is found to be a much more convenient vehicle for the Capsicum, etc., than ordinary absorbent Cotton Wool, as it lends itself more readily for application to the parts affected.

Supplied in bulk in 1-lb. rolls, or cut to any size required. We can supply you with cartons and labels free from stamp duty, or pack it for you in cartons ready for sale.

Write for Samples and Prices.

Robinson & Sons Ltd., Chesterfield

London Address: 168 Old Street, E.C.1

Telephone No. 488.

Telegraphic Address: "APPLIANCE."

J. H. HAYWOOD, Ltd.**CASTLE GATE, NOTTINGHAM.**

ESTABLISHED 1833.



SUPERIOR QUALITY
ELASTIC STOCKINGS and
APPLIANCES,

With and Without Seams.

TRUSSES, Ladies' BELTS, Gents' BELTS,
SUSPENSORY BANDAGES,
CHEST EXPANDING BRACES.
LINT, WOOL, BANDAGES, &c.



WATER & AIR-PROOF
GOODS.

**SURGICAL INSTRUMENTS.**

ELASTIC APPLIANCES and TRUSSES for SPECIAL and DIFFICULT
CASES made carefully to Order.

1789 (DELAMOTTE 1921

A. PLISSON, Sucr. 68 Rue J. J. Rousseau 68,
PARIS.

India-Rubber and Elastic Gum
Surgical Instruments.



CATHETERS, BOUGIES, RECTAL & VAGINAL TUBES, TRUSSES.

The Oldest Firm. Highest Awards. The best one.

W. H. BAILEY & SON

ELASTIC STOCKINGS.

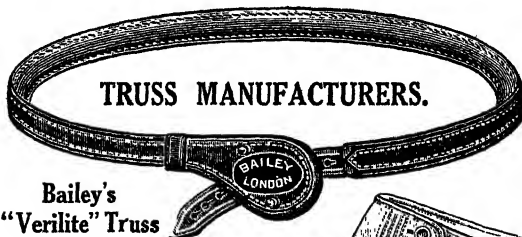
A badly-fitting Stocking, or one made of unsuitable material, is not only no good—it is positively harmful.

"VARIX," All about Elastic Stockings—How to Wear, Clean, and Repair them, post free.

Bailey's Hygienic Washable Imperceptible Flesh-coloured Truss.

No Leather Covering. Particularly suitable for residents abroad. Send size round hips, and state right, left, or double. Special attention to Colonial or Foreign Orders.

Please note New Telephone No.: Museum 1464.

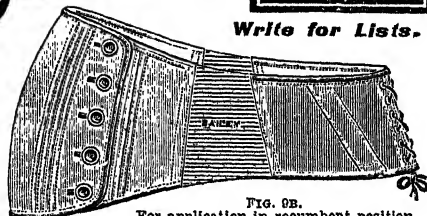


Bailey's
"Verilite" Truss

A perfect Truss. Effective without restraint. Acts simply as a clip, and adapts itself to every movement of the body

BAILEY'S PATENT BELTS.

Telegrams: Bayleaf, London.



Write for Lists.

FIG. 5B.

For application in recumbent position.

38 Oxford St., & 2 Rathbone Place, London, W.1

PRESCRIBE COMFORT

AND INSIST UPON YOUR PATIENTS WEARING THE GENUINE

BALL AND SOCKET TRUSSES

OBTAINED FROM

Established over a Century.

AND
NOWHERE
ELSE.

SALMON ODY, LTD.,

7 New Oxford St., London, W.C.1

DRAPIER & Fils,

41 rue de Rivoli, PARIS 1^{er}

Surgical Instrument Makers



CYSTOSCOPES (Drapier.)

Brilliant
illumination.

URETHROSCOPES.

Most Accurate.

— CATALOGUE FORWARDED ON APPLICATION. —

HOLLAND'S INSTEP ARCH SOCK.

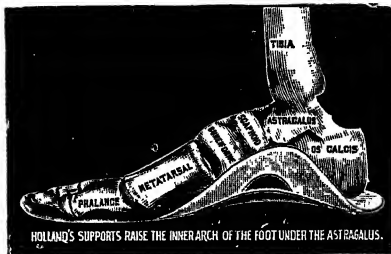
Brit. Med. Jour.—"Most valuable for FLAT FOOT."

The double longitudinal Spring on the innerside gives a **thickening** of a quarter of an inch as a **valgus wedge** which is invisible.

Price 11/6 per pair.

SUPPORTS for Flat Foot and Metatarsalgia in varying degrees.

Send a Pencil Outline of the Foot taken when standing as the best guide for size.



Can be had of the leading Surgical Instrument Makers, or direct from—

HOLLAND & SON,

Foot Appliance & Surgical Boot Makers.

Tel. : 1687 Mayfair. 46 South Audley St., Grosvenor Sq., LONDON.

CATALOGUE OF SECONDHAND

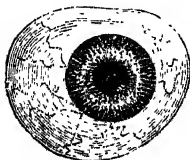
**Surgical Instruments, Osteology,
and Microscopes, Post Free.**



*SECONDHAND SURGICAL INSTRUMENTS,
OSTEOLOGY, and MICROSCOPES BOUGHT.*

MILLIKIN & LAWLEY, 165 Strand, LONDON, W.C. 2 Telephone City 170F.

Artificial EYES.



PACHE & SON,
75 Station St., BIRMINGHAM.

Makers to the Principal Hospitals.

Snellen's Improved & Shell Eyes, fitted & matched to perfection.

SELECTIONS SENT TO SURGEONS.

All genuine Crookes' Glass is good,
but the last is *the* best. It is the
1920 series—briefly Crookes U.

There are no *genuine* Crookes glasses
other than the old 1913 formulæ A
and B and those known as the M
series and the U series which are
under the control of Mr. Melson
Wingate.

Further particulars from—

SIR WILLIAM CROOKES'
ANTI-GLARE GLASS Co. Ltd.

30 WIGMORE STREET,
LONDON, W.1.

THE TINTOMETER, LTD., SALISBURY.

Sole Makers of LOVIBOND'S Patents and Apparatus for

DIAGNOSING DISEASE by COLOUR of the BLOOD.

Dr. George Oliver's Hæmoglobinometer and Hæmacytometer.
Radiometer for use with Sabouraud's Pastilles, as devised by Dr.
Dudley Corbett.

A new form of Apparatus for the quantitative estimation of Colour
Blindness.

Grey's Anthropological Instrument for measurement of Hair, Eye,
and Skin Colours.



Don't Squeeze the 52 Bones of

your feet into ordinary and foolish shoes, that as time goes on will produce corns and bunions, flat foot, and a host of other foot troubles. Educate them NATURE'S Way.

"NATUREFORM"

Shoes are the only Shoes built on really Orthopaedic lasts. They mean health and comfort. Send for Sample Shoe, which will be sent together with illustrated Booklet and full instructions for self-measurement.

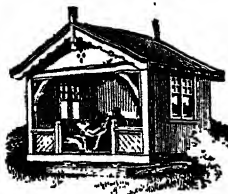


"NATUREFORM" FOOTWEAR.

In ALL Sizes for Adults and Children.

ONLY to be obtained from **SOLE MANUFACTURERS--**
HOLDEN BROS., 3 Harewood Place, Hanover Sq., London, W.1

REVOLVING SHELTERS FOR SANATORIA



Mounted on Patent Wheels with Revolving Gear and Foundation Platform.

— Prices on application. Carriage Paid. —
BEST MATERIALS and WORKMANSHIP.
 — Send for Catalogue of SHELTERS. —

Also makers of all kinds of Poultry Houses, Portable Buildings, Loose Boxes and Motor Houses — State requirements.

Established
80 Years.

Works cover
9 Acres.

Telegrams: **TIMBER, BEDFORD.**
 Telephone No. 34.

J. T. HOBSON & Co. Portable Wood Building Specialists, **BEDFORD**



No. 1.
Fitted with Solid Non-Absorbent Rubber Plug.



No. 4.
Fitted with Super Nickel-plated Body and Screw Cap.



No. 3 D/E.
Fitted with Metal Screw Caps.

POCKET SPITTING FLASKS.

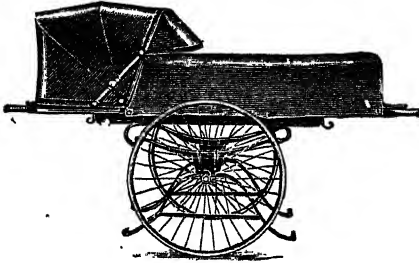
Made in Dark Blue Glass.

FOR USE IN PREVENTING THE SPREAD OF
TUBERCULOSIS

BEATSON, CLARK & Co., Ltd
 Medical Glass Manufacturers
ROTHERHAM, YORKS.

Prices of these and other designs on application.

SIMMONS & CO.'S 'Standard' Ambulance



(As supplied to the
Marylebone Corporation, the
Plymouth Police, &c.)

**PRICE COMPLETE,
£27 11s. 0d.**

ALWAYS READY IN STOCK.

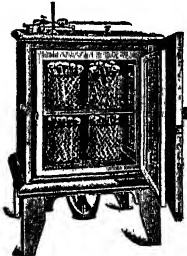
FOLDING STRETCHERS, Woolwich Arsenal Pattern
'Mark II' with shoulder Slings, **78/8.** Boy Scouts Stretchers, **58/-**

SIMMONS & CO. 1, 3, 5 and 7, Tanner Street,
Bermundsey Street, LONDON, S.E.

Hand-Ambulance Builders to the Metropolitan Asylums Board, the
London County Council, the Metropolitan Electric Tramways, etc.

HEARSON'S SPECIALITIES

Used in all the Bacteriological Laboratories in the
World and by all Medical Officers of Health.



Hearson's Patent Biological
Incubator, heated by Gas,
Oil, or Electricity.

We have recently acquired the goodwill
and plant of a well-known Physiological
Apparatus Manufacturer, and we are now
in a position to supply any Apparatus
appertaining thereto. Catalogue in course
of preparation. All orders executed in
rotation.

*BACTERIOLOGICAL CATALOGUE FORWARDED
ON APPLICATION.*



Prof. Sherrington's
Recording Drum.

CHAS. HEARSON & Co. Ltd.
Bacteriological, Pathological, and Physiological Apparatus Manufacturers,
235 REGENT STREET, LONDON, W.1.

ARTIFICIAL HUMAN EYES REFORM AND SHELL TYPE. Made to Order.

WILLIAM HALFORD, Senr.

Maker by appointment to Royal London Ophthalmic Hospital.

**41, UPPER TOLLINGTON PARK, LONDON, N. 4 and
3, UPPER GLOUCESTER PLACE, BAKER STREET, W. 1.**

Telegrams: "OPHTHALMOS, FINSPARK, LONDON."

Phone: HORNSEY 1183.

Telegraphic Address: "Lithotrite, Wesdo," London.

Telephone: 3581 Mayfair.

JOHN WEISS & SON, LTD.

Makers of all Kinds of
Surgeons' Instruments & Aseptic Metal Furniture
for Hospital Theatres and Wards.

Artificial Limbs, Trusses, Elastic Stockings,
ETC.

ESTABLISHED 1787.



CONTRACTORS TO H.M. GOVERNMENT.

287, OXFORD STREET, LONDON, W.1

"A revolution in the art of Urine Testing."—*Medical Press & Circular.*

ENDOLYTIC TUBES

Hermetically sealed Capillary Tubes, by means of which a specimen of Urine can, in a few moments, be accurately tested at the Bedside, for Albumin and Albumose; Glucose; Acetone, and Diacetic Acid.

"An ingenious and delicate means of clinically testing Urine."—*The Lancet.*

"The reactions were obtained most satisfactorily and with great ease."—*British Medical Journal.*

Endolytic Tubes are packed in boxes of 25 at 2/9 each. Cases containing four boxes (100 Tubes), all one kind or assorted, 10/6, including pocket case.

Supplied by the leading Surgical Instrument Dealers and Chemists.

Sole Proprietors of the Patents and Trade Marks:

FLETCHER, FLETCHER & Co., Ltd., HOLLOWAY, N.

The Dental Manufacturing Co. Ltd

LONDON

ENGLAND.

COMPLETE EQUIPMENT.

**The Practice,
Public Dental Service,
School Clinic.**

SCHOOL CLINIC, Illustrated Catalogue,
and other helpful Publications will be
sent free.

**ALSTON HOUSE, LONDON, W.1
NEWMAN ST.,**

Branches throughout the provinces.



KOLYNOS

DENTAL CREAM

Made in England.

The formula of Kolynos Dental Cream represents years of experiment in the laboratory as well as in the surgery.

Every property necessary to secure efficient cleanliness and thorough mouth sanitation has been carefully considered in its compounding.

For more than a decade it has been generally prescribed by Dentists, and has met with very general public favour.

DURING the past year many thousands of Physicians have learned to appreciate its value and are constantly requesting Physicians' packages of Kolynos Dental Cream for distribution in practice. Your request will bring you a free box of Kolynos, containing a quantity for personal use and distribution among your Patients.

KOLYNOS INCORPORATED, 156-157 Aldersgate Street, London, E.C.1.

THE NEEDS OF THE PROFESSION

The needs of the Profession are our constant study in all classes of DENTAL GOODS, and with an experience of one hundred years, we feel that we are better able to-day than we ever were to produce the best in

Mineral Teeth and Porcelain Outfits
Dental Rubbers
Precious Metals
Filling Materials
Operating Room Furniture
Extracting Forceps
Electrical Apparatus

Engines and Engine Instruments
Hand Instruments
Anæsthetic Apparatus
Workroom Tools and Appliances
Sundries **Books**
And all that pertains to Dentistry.

The world-wide demand for our manufactures has necessitated the repeated enlargement of nearly all our Factories. This is very gratifying to us, and we need hardly add that it will always be our sole aim to merit a continuance of the hearty support which has been extended to us in the past.

Our Goods can be obtained through your Dealer.

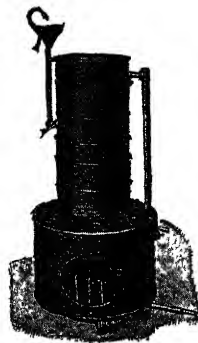
CLAUDIUS ASH, SONS & CO., Ltd.,
5 to 12, Broad Street, Golden Square, LONDON, W.1, England.

ESTABLISHED 1820.

DISTILLED WATER

THE cost of Distilled Water when made by our Gas-Heated Stills is about **One Penny per Gallon**, or less if made in larger quantities by our Steam-Heated Stills. Many hundreds are in use by DISPENSING and MANUFACTURING CHEMISTS, TOILET PREPARATION MAKERS, etc., etc. The Stills are of copper throughout, coated internally with pure tin, and made to patent specification No. 6916, in sizes ranging from output 6 pints per hour to 12 gals. per hour, for heating by gas, fire, steam, or paraffin.

*Send for Explanatory Pamphlet,
—Post Free, from Makers.—*



BROWN & SON,

Alembic Works, Wedmore St., Holloway, N.19

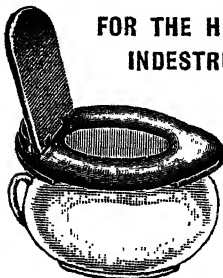
Or Wholesale Supply Houses.

THE "CROWN" CHILD'S CHAMBER SEAT

Patent No. 23969.10.

FOR BABY'S COMFORT. Sanitary, Simple and safe. Adjusts itself to any Full-sized Chamber. On leaving for holidays can be packed in a hand-bag. Weighs only 11 ounces. A good investment. Will outlast a dozen small-sized chambers.

**FOR THE HOME. FOR THE HOLIDAYS. INDISPENSABLE.
INDESTRUCTIBLE. BOON TO MOTHERS AND NURSES.**

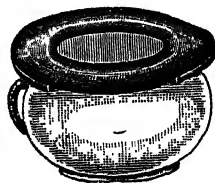


No. 1

No. 1 Seat with Sanitary Cover and Back Rest, for Night Nursery and Sick Room, 6/- Held in position by strong springs under rim.

No. 2. Plain Seat, 4/6
Postage 6d. each extra.

*Write for Complete List of
Elbard Household Specialities.*



No. 2.

May be obtained of all Ironmongers, Stores, &c., or write to—

**ELBARD PATENTS CO. (Dept. M.A.), 40, York Road, King's Cross,
London, N.**

ALLIANCE DRUG & CHEMICAL Co.

34, Leadenhall Street, LONDON, E.C.3

Telephone: Central 1300.

Telegraphic Address: Naltrof, Bilgate.

Established 1812.

Reorganized 1902.

THE Company has specialized for many years past in providing the Medical profession at the lowest possible inclusive prices (no charge for bottles, etc., or cases, etc.) with pure reliable Drugs, Chemicals, Pharmaceutical Preparations, Compressed Tablets, Pills, Surgical Dressings, and Stock Mixtures of approved Formulae as used by the London and other Hospitals.

In appending a few sample prices for guidance of the great saving that can be effected, we quote the current rates we are now charging our customers, but we cannot bind ourselves to these or any prices, as owing to the effect of the war, rates rapidly change; for this reason we are unable to issue any revised detailed list, as same would be unreliable and would only lead to confusion, but we hope by the time this is in print that prices will have become more settled, and we shall take the earliest opportunity of publishing a new list, and then a copy will be sent on receipt of professional card.

We may mention that during the recent great shortage of many Drugs and Chemicals, we have been able, up to the present, to keep all our friends supplied, with very few exceptions, and we have received many letters of thanks for the promptitude in despatch, and the reasonable prices charged, as we have given our customers the benefit of stocks purchased at favourable prices.

We can also supply the preparations demanded by the New Pharmacopœia, and these will be sent unless otherwise ordered.

In many instances our Clients have written us stating we have saved them

40 per cent.

of their usual Yearly Account for Drugs. This saving is not reflected in the quality of our Goods, but is primarily due to not employing TRAVELLERS, thus saving the purchaser the cost of the Travellers' Salaries and Expenses, which greatly enhance the prices the usual Drug Houses have to charge.

NOTE.—Only Terms: Net Cash with order, without discount; or orders received through London Merchants or Bankers. Goods carriage forward. All packages free. Export cases extra. Special terms for Export Orders (see list).

At per lb.		At per lb.	
Inf. Aurant. Conc., 1 to 7 ..	6 lb. 3/5	Inf. Gentiane Co., 1 to 7 ..	5 lb. 1/9
„ Aurant. Comp. Conc., 1 to 7 ..	3/5	„ Quassia Conc., 1 to 7 ..	1/4
„ Buchu Conc., 1 to 7 ..	6/-	„ Ruel Conc., 1 to 7 ..	5/3
„ Calumbæ Conc., 1 to 7 ..	1/11	„ Rose Acid. Conc., 1 to 7 ..	5/4
„ Caryoph. Conc., 1 to 7 ..	2/2	„ Senega Conc., 1 to 7 ..	7/2
„ Cascarella Conc., 1 to 7 ..	2/6	„ Valerian. Conc., 1 to 7 ..	2/11
„ Cinchona Acid, 1 to 7 ..	3/10		
At per lb.		At per lb.	
Lin. Aconiti Meth. ..	5 lb. 2/9	Lin. Camph. B.P. ..	9 lb. 4/-
„ Bellad. Meth. ..	1 lb. 3/1	„ Sapo. Meth. ..	9 lb. 2/9
	5 lb. 6/6	„ Tereb. Acet., B.P. ..	5 lb. 3/3
	1 lb. 6/9		
At per lb.		At per lb.	
Liq. Ammonii Acetatis Conc. 1 to 7 ..	6 lb. 2/-	Liq. Iodi Fort., B.P. ..	5 lb. 8/11
„ Ammon. Aromat. ..	1 lb. 2/6	„ Morphine Acet. or Hydro-	
„ Arsenicalis, B.P. ..	6 lb. 1/3	chlor. B.P. ..	6 lb. 8/2
„ Arsenii Hydrochlor., B.P. ..	7 lb. -/64	„ Opil Sed. ..	5 lb. 9/6
„ Bismuth, B.P. ..	1 lb. -/11	„ Prunl Subacet., B.P. ..	7 lb. -/11
	7 lb. -/6	„ Prunl Virg. p.s. 1 to 7 ..	5 lb. 5/7
	6 lb. 1/10	„ Rhusads pro. syr., 1 to 7 ..	5 lb. 5/-
B.P. Aqnos.		B.P. Aqnos	
Tinct. Belladon. ..	5/9 2/4	Tinct. Hyoscyam. ..	5/9 2/9
„ Benzoin ..	3/5	„ Nucis Vom. ..	4/10 1/10
„ Camph. Co. ..	4/6 2/2	„ Opil ..	6/- 4/8
„ Card. Co. ..	3/6 1/7	„ Quin. Ammon. ..	5/-
„ Gentian. Co. ..	3/6 1/8	„ Rhei Co. ..	3/11 2/8
At per lb.		At per lb.	
Potass. Bromid. B.P. ..	2 lb. 2/6	Ung. Acid Boric Alb. B.P. ..	28 lb. 1/10
„ Iodid. B.P. ..	3 lb. 17/8	„ Hydrag. B.P. ..	7 lb. 6/-
Sod. Salicel. Pulv., B.P. ..	2 lb. 4/8	„ Ammon. ..	1 lb. 6/4
Sod. Sulphas Featheryst. ..	7 lb. -/3	„ Ichthammolis, B.P.C. ..	7 lb. 2/11
Sp. Ether. Nit. B.P. ..	4 lb. 6/3	„ Zinc Ox. ..	7 lb. 3/6
„ „ ..	1 lb. 6/8	„ „ ..	28 lb. 2/3
Sp. Ammon. Aromat. B.P. ..	5 lb. 5/-	Vin. Ipecac. B.P. ..	5 lb. 4/-
Syr. Cascara Aromat. B.P. ..	6 lb. 3/-		
Syr. Glycero-Phosph. Co. ..	6 lb. 3/3		
Ung. Acid. Boric. Flav. ..	28 lb. pall -/11		

PILLS; TASTELESS. COATED TABLETS, COMPRESSED.

Minimum quantity at these prices. Home Trade 3, Export 12 Winchester Quarts assorted.

Ad. 9

Reliable "CIBA" BRAND Products.

(Diallylbarbituric Acid)

DIAL

"CIBA" Brand.

A RELIABLE, prompt, and efficient hypnotic and sedative which causes neither after effects, nor accumulation. It acts in small doses without in any way affecting the functions of the digestive tract.

DIAL is indicated in insomnia accompanying neurasthenia, hysteria, neurosis, also in the privative treatment of morphinism, alcoholism, etc.

It is chemically known as diallylbarbituric acid or diallylmalonylurea. It is sparingly soluble in cold water, freely so in alcohol or ether, and the taste is faintly bitter.

The dose of DIAL in simple nervous excitement is usually $\frac{1}{2}$ a tablet three times a day, to 1 tablet in moderate gravity, up to 2 or 3 tablets at a time in severe cases. Generally speaking, however, it is well to commence with small doses and to individualize carefully.

DIAL is sold in tubes of 12 tablets (each containing $1\frac{1}{2}$ grains), at 2/- tube; and in containers of 100, at 14/-.

(Anhydro-Oxymethylene-Diphosphoric Acid)

PHYTIN

"CIBA" Brand.

INTRODUCED originally by PROFESSOR GILBERT of the Paris Faculty of Medicine, this vegetable nerve and brain food, to use his expression, "solves the problem of rational phosphoric therapeutics." Because of this, it is rapidly increasing in favour among the Medical profession.

Rich in phosphorus (22.8 %), which is wholly assimilable, and owing to its entire freedom from toxicity, PHYTIN is far superior to other nerve products. It has indeed no equal.

Besides its abundant nutritive qualities PHYTIN possesses a wealth of Dynamic properties, manifested by a marked improvement in the general nutrition of the tissues.

PHYTIN stimulates the appetite, and quickly produces an increase in weight and muscular energy. It is prescribed successfully in cases of physical and nervous debility, constitutional weakness, and in convalescence.

Doctors are strongly recommended to give PHYTIN a trial.

*From all high-class Chemists, or the Sole Concessionaires
for the British Empire—*



TRADE MARK.

The CLAYTON ANILINE CO. Ltd.

Pharmaceutical Department,

68 $\frac{1}{2}$ Upper Thames St., LONDON, E.C.4

LITERATURE ON REQUEST.

The Original Brand of

DETOXICATED VACCINES

(PREPARED BY GENATOSAN, LTD.)

IT is most essential, to ensure successful treatment, to employ a vaccine which is actually detoxicated. All Vaccines sent out by us have been detoxicated personally by the discoverer of the process.

Detoxicated Vaccines (Polyvalent), are now prepared by us for :

- 1—Influenza and Pneumonia.**
- 2—Common Colds and Catarrhs,**
e.g. Coryza and Bronchitis, etc.
- 3—Gonococcus Infections.**
(A) Pure Gonococcal Vaccine for acute Gonorrhoea, Gonorrhoeal Rheumatism and Epididymitis.
(B) Gonococcus + Secondary Organisms, for Gleet, Prostatitis and other chronic Gonorrhoeal Infections.
- 4—Staphylococcus Infections,**
e.g. Acne, Furunculosis, Boils, Abscesses, Osteomyelitis, etc.
- 5—Streptococcus Infections.**
Abscesses, Septicæmia, Puerperal Fever, Erysipelas, Rheumatism and Arthritic affections, Pyorrhoea, and Tonsillitis, etc.
- 6—Bacillus Coli Infections,**
e.g. Cystitis, Pyelitis and Bacilluria, Colitis, etc.
- 7—Tuberculosis.**
Limited quantities of Detoxicated Tubercle Bacillus are now available.
- 8—Cerebro-spinal Meningitis.**
- 9—Diphtheria (K.L.B.) Vaccine.**
- 10—Whooping Cough (B. Pertussis).**

These vaccines can be given with safety not only for prophylactic, but also for curative purposes. Their non-toxicity renders them specially suitable for administration during the course of an acute infection.

CURE TESTS FOR GONORRHOEA. PROVOCATIVE VACCINE AND ANTIGEN.

We are now able to supply a special form of non-toxic gonococcal vaccine, which is not only of therapeutic value, but which also acts as a powerful provocative test for cure.

In addition we supply a superior form of gonococcal antigen for use in the complement fixation test.

Particulars may be obtained on application to

GENATOSAN LTD. (British Purchasers of The Sanatogen Company)

12 Chenies St., LONDON, W.C. 1.

BRANCHES IN INDIA, SOUTH AFRICA, EGYPT, AUSTRALIA, &c.

"Stibenyl"

*An advance in the treatment
of Kala-Azar, Filariasis,
Bilharzia, Leishmaniasis,
and Trypanosomiasis.*

*Descriptive
Literature
on request.*

"STIBENYL" contains 36% of Antimony and is in the form of a powder readily soluble in water. It is the sodium salt of p-acetyl-aminophenyl-stibinic acid $C_2H_3O.NH.C_6H_4.Sb.O.(OH)_2$, and is only one-fourth as toxic as Tartar Emetic, and the rapidity of its action in Kala-Azar, etc., is remarkable. It is generally given intravenously and doses up to 0.8 grm. may be injected with safety. Each batch is physiologically tested for toxicity before being sent out.

Sole Distributors:

Allen & Hanburys Ltd.

7 Vere Street, London, W. 1.

*For Infants and
Young Children*

Allenburys'
FRUITINE
CONFECTION

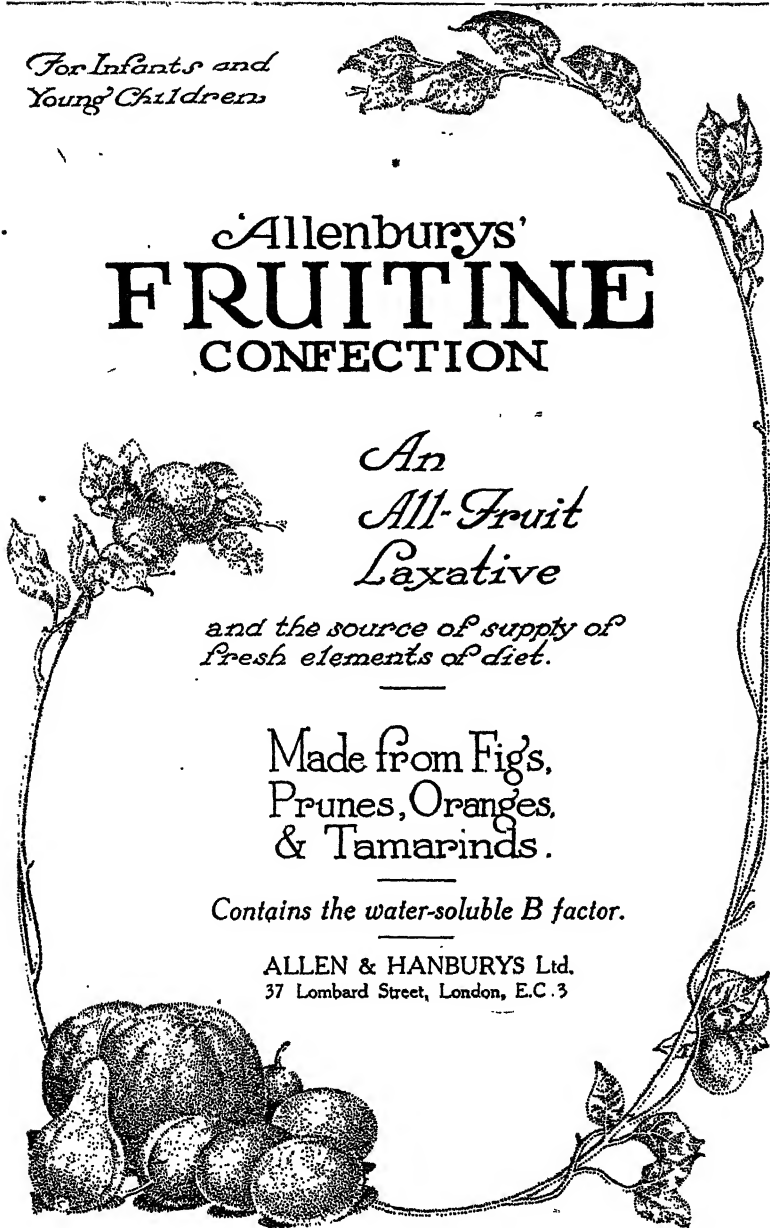
*An
All-Fruit
Laxative*

*and the source of supply of
fresh elements of diet.*

Made from Figs,
Prunes, Oranges,
& Tamarinds.

Contains the water-soluble B factor.

ALLEN & HANBURY'S Ltd.
37 Lombard Street, London, E.C. 3



DIABETIC FOODS

For THE MODERN TREATMENT
OF DIABETES MELLITUS . . .

*Analyses and Calorie Values of
our Foods are always Available.*

Particulars and Samples sent Promptly on request.

CALLARD & CO. 74 REGENT STREET,
(CALLARD, STEWART & WATT Ltd.) LONDON, W.1

THE NEW VITALISING FOOD
FOR BACKWARD CHILDREN—

VITMAR

RICH IN VITAMINES.

*Biological experiments have proved that
Vitmar contains Vitamines—the vital
substances for the growth of Children.*

SAMPLES AND PARTICULARS FREE TO DOCTORS.

MANUFACTURED BY

CALLARD & CO. Food Specialists,
(CALLARD, STEWART & WATT Ltd.)
74 REGENT STREET, LONDON, W.1

THE INTERNATIONAL MEDICAL CONGRESS, LONDON, 1913
AWARDED ITS GOLD MEDAL TO

THE ALWAYS BRITISH NERVE FOOD
San-a-gen

& SAN-A-GEN ANTI-DIABETIC & TONIC BISCUITS

ANALYSIS

Moisture ..	10.6
Ash	7.0
Fat	0.8
Proteids ..	75.0
Undetermined Organic Matter ..	6.6

Phosphoric Acid in Ash ..	3.35
Equivalent to Sod. Glyceroph'ates	12.55

SAN-A-GEN is the Proteid Extract of Milk (treated while absolutely fresh) in combination with Glycerophosphates. It is **PALATABLE** and Ideal as a Nerve Nutrient taken like cream in water, soda water, milk, coffee, cocoa, tea, or mixed in oatmeal and other cereal dishes, omelettes, milk puddings, custards, etc.

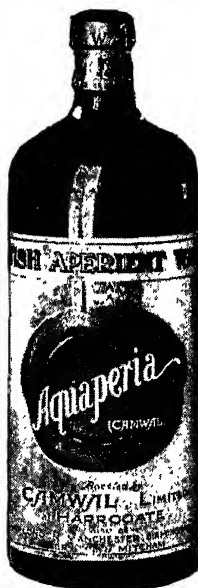
AT CHEMISTS, 4 oz. 3/-, 8 oz. 5/-, 16 oz. 9/6

PHYSICIANS' TRIAL SUPPLIES WILLINGLY SUPPLIED

SANAGEN CO., LTD., Sheepcote Lane, Battersea, LONDON, S.W.

Telephone: Latchmere 4364.

Telegrams & Cables: "Phosaglyc, Batt-Park, London."



Aquaperia

Bottled by CAMWAL Ltd. at their Spring at HARROGATE.

British Aperient Mineral Water

Supplants Apenta, Hunyadi Janos, and other German and Austrian Waters.

Editorial Note from "Lancet," March 20, 1915 :

"The Water is drawn from a Spring at Harrogate. The constituents are well balanced in accordance with therapeutic requirements."

Sold by all Chemists and Drug Stores.

Wholesale Prices for NURSING HOMES & HOSPITALS

CAMWAL Ltd.

Harrogate, Manchester, Birmingham, Bristol, Mitcham, and London.

An Ideal Flesh-forming Food

LACTOMALTINE

(CREAM, MILK, and MALT).

LACTOMALTINE is scientific. It contains the richest **Cream** and **Milk**, combined with the finest **Malt Extract**. It is nutritious, palatable, and digestive.

LACTOMALTINE far surpasses Cod Liver Oil in palatability, assimilability, and digestibility, and in its efficiency as a nutrient.

LACTOMALTINE is adaptable to any diet. It may be given in conjunction with farinaceous foods, or taken alone after food or in tea.

*In Round, Wide-mouth Jars ; Retail, 1/9, 3/6, and 5/6.
Supplied in bulk to Hospitals & Institutions at special rates.*

WRITE FOR DESCRIPTIVE BOOKLET—

HARKNESS, BEAUMONT & CO.,
Junction Bridge, LEITH, EDINBURGH.

PHENATE OF SODA SOLUTION

Sol. Sodæ Phenatis (Woolley).

Invaluable as a Mouth Wash and for allaying tenderness of the gums after Teeth Extraction.

ANTISEPTIC AND ASTRINGENT.

PRICE, Retail, of all Chemists:—

$\frac{1}{4}$ -Pint Bottles, 1/6 ; $\frac{1}{2}$ -Pint, 2/9 ; Pint, 4/6 ; Quart, 7/- ;
 $\frac{1}{2}$ -Gallon, 12/6.

Special Prices to the Medical and Dental Professions.

A DENTIST writes:—"I have found it invaluable in dental practice for syringing the sockets after removal of teeth which have been subject to an acute attack of *periostitis*; the strength used is one part of the solution to 15 parts of hot water, the relief from intense pain being instantaneous."

JAMES WOOLLEY, SONS & CO. LTD.
Manufacturing Chemists, MANCHESTER.

Vitafer

The All-British Tonic Food

Awarded Gold Medal at the last International Congress of Medicine.

VITAFER, introduced before the outbreak of war, now holds the foremost place amongst tonic foods.

Doctors everywhere recommend Vitafer to re-build health. Every tin is a storehouse of new energy, its composition proves this. Vitafer concentrates the *entire* protein of milk with all the forms of phosphorus used and needed by the body.

The only* perfect non-constipating tonic food.

Take Vitafer if you are on the sick list with

NEURASTHENIA, DYSPEPSIA,

NERVOUS ANÆMIA,

EXHAUSTION, INSOMNIA,

and in Convalescence.

A doctor's sample will be sent free and post paid to any Medical Practitioner on request.

In sealed tins, price 1/6 and 2/6 of all Chemists; larger sizes 4/6 and 7/6.

Sole Manufacturers:

SOUTHALL BROS. & BARCLAY, LTD.,

Lower Priory, BIRMINGHAM.

NEURACETIN.

Introduced in 1897, and since proved safe and reliable.

Action : Antipyretic, Analgesic, Anti-neuralgic, and Anodyne.

Relieves pain and reduces temperature, at the same time free from after effects.

Dose : 5 to 10 grains.

In POWDER : 1 oz. boxes, **1s. 6d.** In PELLETS (5 grs.), 1 oz. bottle, **2s.**

We are constantly receiving testimonials as to the efficacy of Neuracetin.

It does not depress the heart as do some synthetic remedies.

It reduces fever and relieves pain.

As a remedy for all forms of headache, neuralgia, and dysmenorrhœa, it is specially valuable.

RUSCOL

(REGISTERED TRADE MARK)

An organic compound of Bismuth and Birch Tar. This ointment has been found most successful in cases of Eczema, Erysipelas, Pruritis, and all Skin Diseases, either itching or inflammatory. Its action is immediately sedative, and its antiseptic and curative properties have been aptly compared with those of iodoform, without the unpleasant odour of that substance.

PRICE IN BULK : $\frac{1}{2}$ -lb. pots, **3s.** each ; 1-lb. pots, **5s.** each.

LIN. METHYL. SALICYL. COMP.

(Wyleys') **8s. 6d.** per lb.

Containing Menthol, Chloral Hydrate, Camphor, Indian Hemp, and Methyl Salicylate.

This liniment will be found of great value in the external treatment of muscular and articular rheumatism, lumbago, sciatica, etc.

LIQ. CERII ET BISMUTH COMP.

7s. 6d. per lb.

Each fluid drachm equivalent to 2 grains of Oxalate of Cerium, associated with Oxide of Bismuth 2 grains, Hydrocyanic Acid (B.P.) 2 minims, Tinct. Nuc. Vomica 8 minims, flavoured with Spirits of Chloroform, and coloured with Compound Tincture of Cardamoms. The value of Oxalate of Cerium in the vomiting of pregnancy is well known, as is also its power to allay obstinate vomiting in cases where Bismuth fails. Dose : 30 to 60 minims.

LIQ. VIBURNI CO.

10s. 6d. per lb.

A compound sedative tonic, designed for uterine cases, and containing Black Haw (*Viburnum Prunifolium*), Hydrastis (*H. Canadensis*), Menyanthes (*M. Trifolia*), and Jamaica Dogwood (*Piscidia Erythrina*). Dose $\frac{1}{2}$ to 1 fluid drachm.

MIST. BISMUTH COMP.

6s. per lb.

Each fluid $\frac{1}{2}$ drachm equivalent to : Tr. Nuc. Vom. 8 mins., Acid Hydrocyan. (B.P.) 2 mins., Morph. Mur. $\frac{1}{4}$ gr., Liq. Bismuthi 60 mins., associated with Chloroform and Aromatics, and coloured as Tr. Card. Com. Dose : 15 to 30 mins.

WYLEYS LIMITED,
Manufacturing Chemists,
COVENTRY.

BACTERIAL VACCINES IN STERISOLS.

(FERRIS)

SCALE OF CHARGES.

VACCINES FROM STOCK CULTURES.

Acne (1) Special mixed emulsion.
(2) Bacillus Acne emulsion.
(3) Staphylococcus mixed emulsion.
(4) Staphylococcus Albus emulsion.
Bronchitis, Chronic Recurrent (winter cough),
Prophylactic emulsion.
Bronchitis, Catarrhal, Mixed emulsion.
Bronchitis, Paroxysmal (Asthmatic), Mixed emulsion.
Carbuncle, Coccal prophylactic emulsion.
Common Cold, Mixed emulsion.
Colitis (Mucus), Mixed emulsion.
Nasal Catarrh, Chronic, Bacillary emulsion.
Pharyngitis, Bacillus septus emulsion.
Pneumonic Complications, Multivalent emulsion.
Pyorrhoea Alveolaris, Mixed emulsion.
Puerperal Sepsis, Multivalent Streptococcal emulsion.
Rheumatoid Arthritis, Mixed emulsion.
Streptococcal Conditions, Multivalent emulsion.
Urethritis, Chronic, Mixed emulsion.
Vesical Catarrh, Bacillus Coli emulsion.

Per box of six graduated
injections.

10/6.

Single injections—

Three lower strengths

(a, b, c),

1/6 each.

Three higher strengths

(d, e, f),

2/6 each.

TYPHOID FEVER, Prophylactic only.

Anti-typhoid emulsion.

Anti-typhoidal prophylactic emulsion, typhoid and
para-typhoid (a & b).

Box of two graduated
injections, 500 millions

and 1,000 millions, 4/6.

Single injections, 500 mil-

lions, 2/-; 1,000 millions,

2/6; 1,500 millions, 3/-.

Gonorrhoeal Affections, Gonococcus emulsion.

Influenza, Bacillary emulsion.

Malta Fever, Micrococcal emulsion.

Cholera, Bacillary emulsion, 1,000 millions in each c.c.,
2/- per c.c.

Box of six graduated
injections, 21/-.

Single injections—Three

lower strengths a, b, c,

2/6 each.

Three higher strengths

(d, e, f), 5/- each.

AUTOGENOUS VACCINES.

While good results are obtained from stock cultures of maintained virulence, the use of autogenous vaccines is of first importance.

For the preparation of vaccines it is essential that the matter from the site of disease be examined and the organisms isolated and identified before a decision is made as to the particular vaccine to be employed. (We supply the apparatus necessary for collection of the matter if desired.)

The fee for the preparation of six graduated injections of Autogenous Vaccine is £2 2s., inclusive of the examination of the specimen, the isolation of the organisms, and the preparation of the vaccine.

The whole of the Emulsions are issued in the form of Sterisols (Ferris). Each injection is enclosed in a hermetically sealed glass tube, and when required for use the Sterisol is snapped at the filo-mark and the needle of the syringe inserted. The filling of the tubes is conducted under rigidly aseptic conditions.

FERRIS & COMPANY, Ltd., BRISTOL.

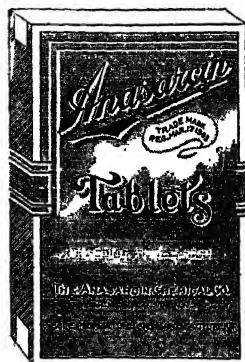


Safe in its action.Certain in its results.

ANASARCIN TABLETS

INDICATED IN THE TREATMENT OF

Cardiac Valvular Lesions,
Exophthalmic Goitre, Cardiac Neuroses,
Dropsy resulting from Chronic Paren-
chymatous Nephritis,
Scarlatina, Hepatic Cirrhosis, etc.,
Albuminuria in Pregnancy, etc.

*Distributors for British Isles—***THOMAS CHRISTY & Co., Old Swan Lane, London, E.C.4**

*Samples and Literature to the Medical
— Profession on request to the —*

ANASARCIN CHEMICAL Co.

WINCHESTER, TENN., U.S.A. and 22 GREAT RUSSELL STREET, LONDON, W.C.1

EMETINE.

Hydrochlorid (WHIFFEN'S) Hydrobromid

FOR HYPODERMIC INJECTION.

Also EMETINE—BISMUTH—IODIDE

FOR ORAL ADMINISTRATION.

"Fortunately we now possess in EMETINE—BISMUTH—IODIDE a drug which sterilises chronic cyst carriers with a certainty not attained by any previous method."—*Vide* Dr. GEORGE LOW, M.A., M.D., in the *Medical Review*, February 1917, page 56.

"EMETINE is specific in Amœbic Dysentery."—E. R. WHITMONK, *New York Medical Journal*.

IODINE AND BROMINE PREPARATIONS.

HYOSCINE, HYDROBROMIDE,

CAFFEINE,

STRYCHNINE, THEOBROMINE, SALICINE,

Alkaloids and Salts.

Mysore Government Sandalwood Oil.

May be obtained by ordering Whiffen's Brand, from all Chemists and Wholesale Drug Houses in the United Kingdom or abroad, or direct from—

WHIFFEN & SONS, LTD., Battersea, London, S.W.11

Telephone—1234, 1235 and 1236 BATTERSEA.

PAMPHLET ON APPLICATION.

SUBITOL

Regd.

Brand of Ammon sulphoichthyoiate.

Guaranteed unvarying content 14 per cent. sulphidic sulphur. No free acid. Completely soluble in water.

Ointment.

Indicated locally in all inflammatory skin conditions.

Soap.

Hæmorrhoids and other rectal disorders. Orally does not disturb the gastric function. Relieves

Suppositories.

Bronchial Asthma, Climacteric disorders, and reactions following Arseno-Mercurial treatment.

Capsules.

CHAS. ZIMMERMANN & Co. (Chem.) Ltd., Medical Department,
9-10, ST. MARY-AT-HILL, LONDON, E.C.3.

Papain-Dega

Regd.

A starch-free digestive ferment. Fully active in any media—Acid, Alkali, or Neutral. May be administered with Alkaline Carbonates in Hyperacidity and Flatulent Dyspepsia. Stimulates gastric function.

Prepared in Powder and Tablets.

Sample on request.

Chas. Zimmermann & Co. (Chem.) Ltd.,
Medical Department,
9-10, St. Mary-at-Hill, London, E.C.3.

Subitine

Regd.

Subitol and Glycerine.

An antiseptic osmotic wound dressing which penetrates infected areas, liquefies pus and evacuates concealed pockets. Promotes free drainage and reduces inflammation. When Subitine is applied dressings remain absorbent and do not adhere to the wound surface.

4 oz. Bottles and 1 lb. Tins.

Chas. Zimmermann & Co. (Chem.) Ltd.,
Medical Department,
9-10, St. Mary-at-Hill, London, E.C.3.

Anusol Suppositories

Regd.

*Non-toxic**Non-irritant*

On account of slow dissolution, the Medicament is kept in contact with inflamed membrane for a prolonged period. Anusol Suppositories promote liquefaction of impacted fæces. Indicated in chronic Hæmorrhoids, Anal, Rectal and Vaginal affections. Prolonged treatment does not impair natural functions.

Original Boxes of 10.

CHAS. ZIMMERMANN & Co. (Chem.) Ltd.,
Medical Dept., 9-10, ST. MARY-AT-HILL, LONDON, E.C.3.

THE ORIGINAL PREPARATIONS.
MIST. PEPsinÆ CO. C. BISMUTHO.
 (HEWLETT'S)

COMPOSITION.—Pepsin, Bismuth, Sol. Opil Purif., Hydrocyanic Acid (B.P.),
 Tinct. Nux Vomica, &c.



Useful in all forms of Dyspepsia, Pyrosis, Gastric pain and vomiting, and for alleviating the pain in cases of Ulcer and Cancer of the Stomach.

Dose—3ss to 3j diluted.

"Obviously likely to be of much advantage in the frequent cases of irritative dyspepsia, with atony of gastric or intestinal muscular layers."—*British Medical Journal*.

LIQ. SANTAL FLAV.
C. BUCHU ET CUBEBÆ.
 (HEWLETT'S)

Since its introduction it has been largely prescribed all over the world as a Specific in certain cases.

Dose—3j to 3ij in Water or Milk.

"Experience has shown this preparation to possess the same efficacy as Santal Oil itself."—*Practitioner*.



To ensure obtaining the Original Preparations, Physicians are earnestly requested to write "HEWLETT'S"

INTRODUCED AND PREPARED ONLY BY

C. J. HEWLETT & SON Ltd., 35 to 42, Charlotte St., LONDON, E.C.2

The High-class Pharmaceutical Products of

The CHARLES H. PHILLIPS CHEMICAL CO.

14, Henrietta Street, Covent Garden,

LONDON, W.C. 2

"MILK OF MAGNESIA" { Mg. H₂O₂
 24 grs. to
 1 oz.

(Registered Trade Mark)

"PHOSPHO-MURIATE OF QUININE"

COMPOUND.

PHILLIPS'

SAMPLES AND LITERATURE
 SUPPLIED ON APPLICATION.

ELECTRARGOL

(ELECTRIC COLLOIDAL SILVER).

For Hypodermic Injection—

Boxes of 6 tubes of 5 c.c.

For Surgical Use—Bottles of 50 and 100 c.c.

Boxes of 3 tubes of 10 c.c.

Collyrium—In minim-metric special ampullæ of 10 c.c. for counting drops.

THERAPEUTICAL INDICATIONS:

All infectious diseases and in particular **Pneumonia, Bronchopneumonia, Typhoid, Typhus, Tetanus, Measles, Variola, Septicæmia, Scarlatina, Cholera, Erysipelas, Malta Fever, Acute Meningitis, &c.**

"Employed hypodermically arrests septic infective processes, puerperal infection, &c."—*B.M.J.*, Vol. I., p. 252; 1912.
 "Electrargol.....absolutely innocuous."—*LANCET*, Vol. I., pp. 89, 322, 684, 1344; 1912.
 "Small-pox treated with Electrargol."—*B.M.J.*, Vol. II., p. 906; 1913. Vol. I., p. 1236; 1914.
 "In Measles."—*LANCET*, Vol. I., p. 49; 1914.
 "In Plague."—*B.M.J.*, Vol. I., p. 1236; 1914.
 "Colloidal Silver of real service in Erysipelas."—*MEDICAL PRESS*, Vol. I., p. 377; 1914.

LOCAL APPLICATIONS:

EMPHYEMA, MASTOIDITES, Mammary Abscess, Epididymitis, Orchitis, Whitlow, Furunculosis, EYE DISEASES.

ENESOL SALICYLARSINATE of MERCURY.

AN IDEAL COMPOUND FOR COMBINED ARSENO-MERCURIAL
TREATMENT OF SYPHILIS.

Superior to all others on account of:—

1. **Its slight Toxicity**, rendering possible the administration of comparatively large doses of mercury and arsenic without setting up intolerance.
2. **Injections Painless**, even in full doses. Never causes induration.
3. **Double specific action** (mercurial and arsenical).
4. **Pharmacology and Doses.**—**Tubes of 2 c.c. and 5 c.c.** containing 3 cgr. (0.46 grain) per c.c. solution. **Medium Dose.**—Intramuscular injections of 2 c.c., corresponding to 6 cgr. (0.92 grain) of **Enesol** per day. Should be injected by preference in the gluteal region.

Large doses or saturated solutions.—Intramuscular injections of 4 to 6 c.c. corresponding to 12 to 18 cgr. (1.85 to 2.77 grains) of **Enesol** every two or three days. Intravenous injections of 2 c.c. to 10 c.c., corresponding to 6 to 30 cgr. (0.92 to 4.63 grains) of **Enesol**, according to the subject, urgency, and gravity of the case, every two or three days.

Sold only in Boxes of 10 tubes of 2 c.c. each, and 6 tubes of 5 c.c. each.

The above Preparations have been authorized by the FRENCH Ministries for use in the
NAVAL AND MILITARY HOSPITALS.

CACODYLATE OF SODIUM (CLIN) (Organic Arsenic).

Emphatically recommended by Professors GAUTIER, RENANT, LETULLE, &c., in the treatment of
TUBERCULOSIS (either incipient or declared), IMPALUDISM, DIABETES, DERMATOSES AND CANCER.

TUBES (Sterilised for Hypodermic Injection).—Each Tube contains a sterilised solution dosed at either $\frac{3}{4}$ grain or $\frac{1}{4}$ grains of Pure Cacodylate of Sodium per injection of 16 minims.

Sold in boxes of 20 tubes of $\frac{3}{4}$ grain each, or 14 tubes of $\frac{1}{4}$ grains each.

GOLD MEDAL, INTERNATIONAL CONGRESS OF MEDICINE, LONDON, 1913.

Full literature sent post free on application to F. H. MERTENS, 61, Holborn Viaduct, London, E.C.1
CLIN LABORATORIES—PARIS.

AMBRIODIN (CENTAUR)

IN THE TREATMENT OF

EPILEPSY

has proved of remarkable value. It quickly reduces the attacks without the undesirable effects invariably accompanying the administration of Potassium Bromide. The patient's general health is not impaired, but distinctly IMPROVED. The preparation in TABLET form is quite TASTELESS, easily ASSIMILABLE, and perfectly SAFE.

Vide: **THE LANCET**, Vol. I. (1930), No. XX., pp. 1074, May 15; **THE MEDICAL PRESS**, Vol. CLX. (1930), No. 4225, April 28th. **THE PRACTITIONER**, July, 1930.

AMBRIODIN (Centaur) is NOT advertised to the public.

FULL PARTICULARS AND LITERATURE FROM—

THE CENTAUR CHEMICAL CO. LTD.,
Bassishaw House, Basinghall Street, LONDON, E.C.2.

Useful and Popular Formulas



Just the combination you need!

Practitioners will find dozens of useful routine prescriptions in the new Shadforth List of PILLS, TABLETS, CAPSULES, EMULSIONS, ETC. MR. SHADFORTH also makes a speciality of dispensing every variety of Private Formulas for the busy and overworked practitioner. Send for the list (Medical) and ask for quotations.

PILLS,
TABLETS,
CAPSULES,
OINTMENTS,
EMULSIONS,
LINIMENTS,
ETC., ETC.

ADDRESS:

MR. WILLIAM SHADFORTH, Pharmaceutical Chemist
(SHADFORTH PRESCRIPTION SERVICE LTD.)
(Dept. M.A.) 63 Grove Road, Bow, LONDON, E.3. (Phone: 3644 EAST)
(„ 920 CENTRAL)

City Address: 49 King William Street, London Bridge, E.C.4.
Factory: Mitre Works, Cordova Road, Bow, E.3.

A Water-soluble, Protective, Skin Application



Successfully used in the treatment of

Eczema, Psoriasis, Lupus Erythematosus, &c.
Practically a non-greasy Ointment, drying rapidly and requiring no dressing or covering.

In addition to Plain "Pellanthum", which is suitably coloured to a Skin Tint, the following combinations are being extensively used:—

"Pellanthum" Ichthyol 3%, 5%
"Pellanthum" Ichthyol 5% et Resorcin 2%
"Pellanthum" Carbonis Deterg. 10%, 15%

"Pellanthum" can be combined with all ordinary Skin Medicaments.

In Collapsible Tubes, 2/- and 8/-, and may be obtained through all Wholesale Firms, or from the Manufacturers—

HANDFORD & DAWSON, CHEMISTS, HARROGATE.

London Agent: Mr. W. MARTINDALE, 10 New Cavendish Street.

PRESCRIPTION BOOKS. Single or Duplicate.

Gold Stamped, Round Corners, Printed and Perforated.

Full Particulars and Prices on application to—

JOHN WRIGHT & SONS LTD., Publishers, BRISTOL.

Hospitals & Public Institutions buy direct

"WHITE HEATHER" (B.P.) Liquid Paraffin. Finest White Liquid Paraffin, in steel drums of about 40 gallons each at lowest prices, carriage paid.

PHAR. CASTOR OIL, etc.

"AUTOLEUM" Motor-Car Oils and Greases.

Astral Fluid and Powdered Disinfectants.

"TURPOLENE" (Turps. Sub.), etc.

THE RELIANCE LUBRICATING OIL CO., LTD.,

19 and 20 Water Lane, Great Tower Street, LONDON, E.C.3.

Telegraphic Address :
"SUBASTRAL, LONDON."

ESTABLISHED
1888.

Telephone Number :
"AVENUE 5891."

Contractors to His Majesty's Government, Crown Agents for the Colonies, Railways, Municipal Authorities, Theatres, Cinemas, &c.

Wholesale Druggists.

**Willows, Francis, ==
Butler & Thompson, Ltd.**

40 ALDERSGATE STREET,

LONDON, E.C. 1

Telephone :
CITY 3618 and 9.

Telegrams :
FORTY, LONDON.

ESTABLISHED 1751.

LAC BISMUTHI (Symes)

This is a Hydrate of Bismuth, and is the most active and efficient form in which Bismuth can be prescribed. Dose: 3j to 3ij alone or diluted. It may be given in combination with alkalis, Hydrocyanic Acid, etc.

LAC BISMUTHI ET CERII (Symes)

This combination of Bismuth and Cerium Hydrates has been found specially useful in relieving the sickness which occurs during pregnancy. Dose: 3j to 3ij.

SYR. HYPOPHOSPH. HYDROBROM. Now largely prescribed in Consumption and Wasting Diseases—most reliable preparation. Dose: 3ij.

The Improved CHLORIDE OF AMMONIUM INHALER.

Most simple and efficient. Price 5/-.

SYMES & CO. LTD., Manufacturing Chemists,
LIVERPOOL.

—Obtainable from Dispensing Chemists generally.—

Sulphaqua

Largely and Successfully Prescribed in the Local Treatment of
Skin Diseases, Gout, Rheumatism, &c.

Possesses powerful antiseptic, anti-parasitic, and analgic properties. Relieves intense itching and pain, is without objectionable odour, and does not blacken the bath enamel.

SULPHAQUA SOAP. Recommended for the
—SKIN and HAIR.—

Especially useful in the treatment of Acne and Seborrhoea of the Scalp.
In Boxes of $\frac{1}{2}$ and 1 doz. Bath Charges, 2 doz. Toilet Charges, and $\frac{1}{2}$ doz. Soap Tablets.

Samples and Literature on request. Advertised only to the Profession.

The S. P. CHARGES CO. Manufacturing Chemists, St. Helens, LANCs.

SALAMON'S ÆTHER AND CHLOROFORM

As exclusively used by the most eminent
Anæsthetists in the Kingdom. Anæsthetical
and Analytical Reports on application to—

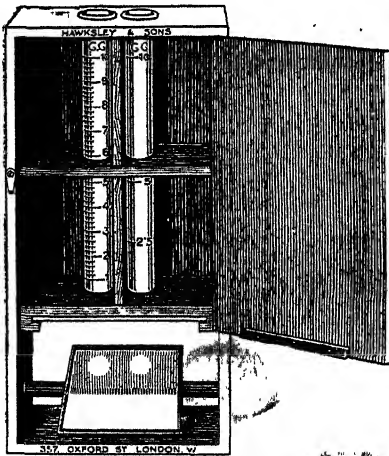
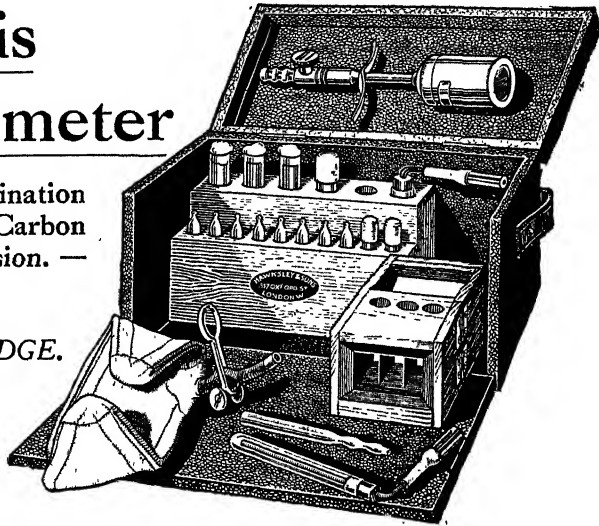
SALAMON & CO. Ltd., Manufacturing Chemists,
RAINHAM, ESSEX. Estab. 1878.

Acidosis Tensimeter

For the Determination
of the Alveolar Carbon
— Dioxide Tension. —

*As suggested by
Dr. CAMMIDGE.*

Marriott's Method
(*Journal American
Med. Association,*
May 20th, 1916, p.
1594).



A SIMPLE Colorimeter

*—As suggested by—
Dr. CAMMIDGE.*

■■■■■■■■■■



FULL PARTICULARS OF
THESE INSTRUMENTS ON
APPLICATION.

HAWKSLEY & SONS, SOLE MAKERS,

357 Oxford St., LONDON, W. 1

Telephone: 1182 Mayfair.

Telegrams: "Sphygmie. Wesdo, London."

NEPENTHE.



A preparation derived ENTIRELY FROM OPIUM by a process which, whilst eliminating all those constituents that give rise to disagreeable after-effects, retains, in the fullest degree, the unrivalled sleep-producing and pain-allaying properties of the drug.

We desire to direct attention to the following letter received recently from a member of the Medical Profession, speaking of the benefit derived from the administration of NEPENTHE in his own case.

Dear Sirs,

This letter (written with the left hand) is intended to convey my intense gratitude for the NEPENTHE received on Tuesday.

On December 20th I had a cycle accident, resulting in severe concussion, and a compound comminuted T-shaped fracture of the lower end of right humerus, communicating with the joint.

I suffered a great deal from pain and shock.

Morphia, though clearly indicated, was given with dire results—foul tongue, headache, and, worst of all, intense skin irritation; the after-effects of the morphia were so marked, that it had to be stopped. Various hypnotics had been tried and proved useless, and in desperation a dose of Morphia was given on Monday night; result—intense urticaria, swollen lips, hands and joints.

On Tuesday I got the NEPENTHE; the effects were immediate and astounding—quiet, restful sleep; after-effects—no headache, clean tongue, bowels acting, and for the first time since my accident I had a desire for food at lunch and dinner yesterday.

The comfort I have received has been so great that I wish you to bring the case to the notice of the Profession in a strictly legitimate way.

Yours faithfully,

—, M.B., C.M., (Aberdeen).

Sent out in the following forms:—

Nepenthe (ordinary), in 2 oz., 4 oz., 8 oz., and 16 oz. Bottles.

Glycerole of Nepenthe, for Hypodermic injection (8 times the single strength), in 1 oz. Bottles.

Double Strength Nepenthe, in 2 oz., 4 oz., 8 oz. and 16 oz. Bottles.

Nepenthe Suppositories, in boxes of 3 doz. (in moulds of distinctive shape), four strengths, equivalent to $\frac{1}{8}$ gr., $\frac{1}{4}$ gr., $\frac{1}{2}$ gr., and 1 gr. Morphia respectively.

Preparations which make various claims to unique merit are continually being offered to the profession. They often prove exaggerated and ephemeral. The reputation of Nepenthe is based not on our advertisements but on the experience of thousands of practitioners of successive generations.

SOLE MAKERS AND PROPRIETORS:

FERRIS & COMPANY LTD.,
BRISTOL.

Indian Agricultural Research Institute (Pusa)

LIBRARY, NEW DELHI-110012

This book can be issued on or before

Return Date	Return Date